THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Consumers of pig iron and of finished iron and steel are still holding aloof from the market, though the volume of inquiry would indicate early needs of considerable proportions. Fuel is the dominant factor, as it has been for more than a year; and as it is mainly responsible for present prices, it bids fair to prolong substantially this level for some distance into the new year. Buyers distinctly avow their expectaton of lower prices, yet some of them are making contracts for several months ahead, while others pay the market price for a few weeks' supply and retire to await developments. Foundrymen are in position to appreciate the argument of blast furnacemen that with coke at double the price of a year ago, and in the Eastern States with foreign iron laid down at more than barely competing prices, even after the $4 duty is paid, the new year does not afford the profit of the later months of the old. But foundrymen in turn find that with pig iron and coke both far above the contract prices of 1902, they cannot get prices for castings that will give them the margin they had in 1902. The question comes back, as in 1902, to the supply of coke that will be available for furnace and foundry. Southern furnaces conferred again about prices last week, but no change is announced, and $18 to $18.50, Birmingham, continue to be quoted for No. 2 foundry for the second half of the year. For first quarter $19.50 to $20 is the range and for second quarter $19. The market meantime is narrow, but producers being well booked ahead, are not making concessions. German and Middlesboro irons are still in moderate demand in the East, and recent sales indicate rather firmer prices due to the influence on ocean freights of renewed efforts to import coal. Southern furnaces meantime are doing little in the East, and are therefore the more strenuous in their objections to the further proposed advance of 50 cents on pig iron, which the Southern Iron Committee is soon to consider. The Bessemer iron market is inactive. Recent sales establish the price of $22 at furnace for first quarter and $21.50 for first half. With the coming in of new furnaces the United States Steel Corporation will have additional pig iron capacity of 500,000 tons a year by April and is likely to require little if any iron from merchant furnaces. The latter will require three or four months to work off present contracts—longer, if the winter should bring much severe weather, as in the past week, when coke supply was much cut down by railroad difficulties. The principal activity in finished material has been in bars, with some irregularity in prices. The large bar capacity now available makes this market one in which developments will be watched with interest. Competition is keen for sheet contracts and two or three independent mills in particular have been making sharply competitive prices. It is understood that the tube mill at Sharon, Pa., will not be operated for the present, as there is no desire to increase tube production in open-hearth lines. The report that the steel corporation rail mills have booked their full capacity for 1903 is incorrect. With the 400,000 tons carried over to 1903 the total placed with mills is 2,200.000 tons. No announcement of Lake Superior ore prices for 1903 has been made as yet, but they are not expected to vary greatly from the basis for last year. Buyers are inquiring and sales may be made by the end of the month.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, JAN. 14.

The market in nearly all lines continues quiet and inactive and the buying movement which was anticipated shortly after the first of the year has not yet set in. In steel bars a few large contracts have been placed but in many instances consumers are buying small lots to tide them over temporarily. In the heavier lines buying is limited entirely to small lots for immediate consumption and buyers are evidently awaiting some concessions before placing contracts for future delivery.

The foundry iron market is somewhat easier and some brands of No. 2 can now be had for immediate delivery at $22 to $22.50. Despite these quotations consumers not yet covered fully during the first half of the year are holding off believing that with the better operation of the furnaces and with increased furnace capacity prices will come down in the next three months. There has been practically no buying of Bessemer iron, although the market remains firm at $21.50 for delivery during the entire first half and $22 for delivery during the first quarter, at the furnace. This market is expected to continue firm for the reason that all furnaces are behind on their deliveries and no large amount of iron for early delivery can be placed on the market until old contracts are cleaned up.

The extreme cold weather this week has again greatly interfered with coke shipments and nearly a dozen furnaces in the two valleys were compelled to bank for short periods. The natural gas supply which was greatly reduced by the weather resulted in the shutting down of many mills in this district and they will not be in position to operate until the weather moderates sufficiently to permit a normal flow of gas. Although situated right in the center of the great coal field of Western Pennsylvania many mills are suffering on account of the shortage in the supply and the freezing of the rivers prevents the river coal shipments entirely.

The transactions in steel are very limited, due almost entirely to the high prices asked by the mills. We note the sale of 1,000 tons of Bessemer billets at $30.75, Pittsburg, the delivery price being practically $31.50. Special sizes of Bessemer billets in small lots have sald at $31 and at the present time there is no difference in price between Bessemer and open-hearth steel. The German steel market has also advanced and ordinary billets are held at $30.50, Pittsburg.

The report emanating from New York, that the United States Steel Corporation will not accept further business in rails for delivery in 1903 has been emphatically denied, as the mills can still take care of a large tonnage to be delivered the latter part of the year. The corporation mills now have new orders on their books for about 1,200,000 tons of rails for delivery this year, while outside mills have orders for about 600,000 tons. The rail tonnage that has been carried over is estimated at nearly 400,000 tons thus making a total tonnage already provided for this year of nearly 2,200,000 tons.

PIG IRON.—The deal for the lease of the Mabel and Sharpsville furnaces at Sharpsville, Pa., by W. P. Snyder & Co. has not yet been closed although it was believed that all matters would be settled early this week. These furnaces have an annual output of 150,000 tons and should W. P. Snyder & Co. secure the lease it will make this concern one of the largest merchant producers of steel making iron in the country. In addition plans have been prepared for the erection of two additional furnaces by this company at Sharpsville, Pa., contracts for which are soon to be awarded. The foundry iron market continues quiet although small lots for fairly prompt shipment can be had at $22 to $22.50. There is little buying for first half delivery and practically no buying for the second half. One consumer in this district covered his requirements of a special brand of No. 2 foundry for delivery the second half, the price not entering into the negotiations to so great an extent as the necessity of having the iron secured. Forge iron is stronger and for early delivery $21 to $21.25 is asked. There is practically no basic iron moving. We revise quotations as follows:

Bessemer, Valley	$21 50 to 22 00
Bessemer, Pittsburg	22 35 to 22 85
No. 1 Foundry	23 00 to 24 00
No. 2 Foundry	22 00 to 22 50
Gray Forge, Pittsburg	20 75 to 21 00
Chilled Basic, Valley	21 00 to 21 50
Chilled Basic, Pittsburg	21 85 to 22 35

STEEL.—Outside of a few small sales the steel market continues quiet, large buyers not yet having covered, chiefly due to the high prices asked for both Bessemer and open-hearth. We note the sale of 1,000 tons of Bessemer billets for early shipment at $30.75, Pittsburg, or about $31.50, delivered at buyer's mill. We also note the sale of a small lot of special size Bessemer billets at $31 at mill. Open-hearth billets for ordinary sizes and specifications are held at $31, but special sizes and high carbons are held at proportionately higher prices. Foreign steel for domestic consumption is not being purchased in this district although the sale of 2,000 tons of 2x2 German billets was made at $31, Pittsburg, February and March delivery, the finished product to go into the export trade giving the manufacturer the benefit of the drawback. Bessemer rods are held at $36.

FERRO-MANGANESE.—English ferro, 80 percent, is held at $49 to $50 in 50 ton lots and over delivered at buyer's mill. Smaller lots are held at $55 per ton.

SPELTER.—The market is somewhat firmer and prime western grades are held at 4.60c to 4.62½c. Pittsburg in carload lots.

MUCK BAR.—The advance of 12½ cents per ton in the cost of puddling iron will further increase the cost of producing muck iron. The market is somewhat firmer and small sales have been made during the week at prices ranging from $34 to $34.50.

SKELP.—Demand for skelp 4 inches and smaller is very strong and as high as 2.15c continues to be paid for these sizes. Wider sizes can be readily secured and are held at 1.90c to 1.95c for either grooved or sheared. Steel skelp is held at 1.95c.

RAILS AND TRACK MATERIAL.—The total rail tonnage now on the books of the rail mills of this country to be rolled this year amounts to nearly 2,200,000 tons. We make the following quotations: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $43; 12 pounds, $42; 16 pounds, $40; 20 pounds, $39; 25 to 40 pounds, $37 to $38. Track materials: Spikes, 2.15c to 2.25c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c.

PLATES.—The amount of new business that is being placed in plates is not heavy but owing to the large tonnage already on the books of the mills deliveries are from three to four months behind. We quote: Tank plates ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary, fire-box, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive fire-box, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches wide, 5c extra 100 pounds. Plate 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

BARS.—Several large contracts for steel bars have already been placed by Western consumers but the majority of the buyers are still out of the market. One large contract closed with a Western consumer calls for the delivery of 5,000 tons during the year while another order for 10,000 tons will shortly be placed by the American Locomotive Co. Quotations are unchanged as follows: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c, Pittsburg, with freight added to point of delivery. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

STRUCTURAL MATERIAL.—While the mills are figuring on a large tonnage the amount of new business that is being placed is not very heavy and deliveries can be made more promptly. Agreement quotations are as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

PIPES AND TUBES.—The current business in merchant pipe and casing is up to the normal for this season of the year while the demand for boiler tubing is very large. Prices on carload lots, plus the freight to destination, are as follows:

MERCHANT PIPE.

	Steel		Guaranteed Wrought Iron	
	Black Percent.	Galv. Percent.	Black Percent.	Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	73	63	70	60
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	69	57	65	54
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	70	58	66	55
Extra Strong Plain End				
⅛ to 8 inch	60	50	65	55

Threads only—Same as Plain End, plus 1¼ percent net.
Threads and Couplings—Same as Plain End, plus 2½ percent net.

Double Extra Strong Plain End				
⅛ to 8 inch	61	51	57	47

Threads only—Same as Plain End, plus 2 percent net.
Threads and Couplings—Same as Plain End, plus 3 percent net.

NOTE: Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	63

SHEETS.—The demand for sheets is improving and the volume of business that is being placed for the lighter gauges is heavier than for some time. The committee appointed at the last meeting of the independent sheet and tin mill association is now on a tour interviewing owners of plants not at the meeting with reference to the advisability of forming a combination and erecting a steel plant. The officers of mills in this district have not as yet been visited. Black sheets in 500 bundle lots and over are quoted as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

WIRE AND WIRE NAILS.—Demand continues fair but there

will be little heavy buying until the large lots contracted for some time ago will have been taken out. We quote as follows: Wire nails, carload lots, to jobbers f. o. b. cars, Pittsburg, $1.90; plain wire, carload lots, $1.80; barb wire, carload lots, $2.20; staples, carload lots, $2.10. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Cut nails are quoted as follows: Carload lots, $2.05, and less than carload lots, $2.10 f. o. b. Pittsburg, plus freight to point of destination. Terms, 60 days, less 2 percent off in 10 days.

MERCHANT STEEL.—Demand for all lines continues strong, although the buying of shafting is rather limited, as consumers believe some concessions should be made. We make the following quotations: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

OLD MATERIAL.—Foundries are buying rather freely, but mills are not covering for future requirements. Steel casting plants have been experiencing much difficulty in securing low-phosphorus melting stock and fully 4,000 tons of foreign material has been brought into this territory for the steel casting plants of this district. The material was sold at $24 to $25 according to delivery and while some of it ran rather high in phosphorus, the average was about up to the requirements for steel casting work. We make the following quotations, gross tons: Heavy melting stock, $22 to $22.50; low phosphorus melting stock, $24 to $24.50; steel rails, $21 to $21.25; re-rolling rails, $22 to $22.50; No. 1 cast scrap, $18 to $18.50; borings and turnings, $11 to $11.50; busheling scrap, $16 to $16.50; old iron rails, $24.50 to $25.

COKE.—Foundry coke for prompt shipment still commands from $7 to $7.25 a ton at the ovens, while on contracts for delivery during the first half of the year $5.50 to $6 is asked. Furnace coke for prompt shipment is held at $5.50, while on contracts $4 to $4.50 is quoted. The stock of coke in the yards of coke producers in the upper and lower Connellsville region is estimated at about 400,000 tons and the stock piles are growing larger daily, owing to the inability of the railroads to supply sufficient cars to move the material. For the week ending Saturday Jan. 3, the output of the upper region amounted to 237,739 tons, an increase of about 25,000 tons over the tonnage of the previous week. The output of the lower region amounted to 47,100 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Jan. 13.

Interest locally centers chiefly in the fuel famine, which grows from bad to worse. While at the present time few of the local furnaces are out of blast, none can say with any certainty how long they will continue in operation. The day's supply of coke determines that. The heavy fall of snow in the past week has made the local condition worse. All the furnaces are skating on thin ice, as one operator put it, and few have stocks in their yards that will last them longer than two or three days at the utmost. If the railroads cannot move cars forward more rapidly in the coming week many furnaces and foundries will have to suspend operations in a short time. So bad is the outlook, that the leading seller is reserving all the coke it receives for use in its own furnaces before transshipping any on its contracts. Not for months has the condition been as grave as at the present time. Southern furnaces are also suffering from the inability of railroads to properly care for their traffic. Shipments of pig iron to Northern points are considerably delayed on account of the scarcity of cars. Large stocks are in every yard, with no prospect of moving them for some time to come. The leading cast iron pipe interest has 300 carloads of materal in its Southern yards which it has been unable to ship for several weeks owing to the car shortage. That this state of affairs will affect prices is inevitable. It is already seen in the confidence of sellers and the firmness of quotations. Melters have not been placing orders as freely as was anticipated, but there is no anxiety displayed over the outlook by furnace agents, who are confident that the market will maintain its present strength.

The past week has not been notable for heavy buying of either crude or finished material. There was good inquiry for foundry irons in small lots, and several thousand tons of malleable Bessemer were sold for forward deliveries. Malleable foundries have also been active buyers of standard Bessemer for quick shipment. It is significant of the local situation that foreign iron is again being offered in this market. In finished departments, bars, sheets, merchant pipe and wire products are the most active. Plates are also in strong demand, though the local interest is not booking any orders at present, having sold its capacity up to next July. Inquiries for heavy rails are frequent, independent mills booking several orders for late deliveries from electric roads. Several large deals in structural steel are under foot, notably one with the Santa Fe Railroad. This company is in the market for 3,000 freight cars. If steel under frames are specified, as is expected, about 16,000 tons of steel will be required. The scrap market is weak, mills not buying anything.

PIG IRON.—Gauged by actual transactions alone, this market would not show very great strength. The past week has seen little change over that preceding. There are inquiries in plenty, but no great volume of orders. Melters are not buying because the impression prevails that by waiting better prices will be obtained. While this policy has resulted in a lowering of values for spot iron and for deliveries in the second quarter, it has not weakened the price for the second half. This is still held at $18 Birmingham for No. 2 foundry. For delivery in the months from April to June, $18.25 to $18.50 is asked, while spot iron is generally held at $19. Sales were made last week, however, at $18.50 for iron on track, though this is scarcely a criterion since the seller either had to dispose of the iron or pay car demurrage. He preferred to do the former, and it is doubtful if the price could be duplicated. The buying of foundry grades has been confined mostly to lots below 500 tons. The inquiry aggregates many thousand tons. That an active buying movement will set in shortly, is the opinion of everybody. Stocks in foundry yards are low, and owing to the bad weather, railroads are not moving freight quickly. Shipments from the South are becoming worse, and the local furnaces are depending on the day's receipts of coke to keep in blast. Very little spot iron can be obtained, as all the furnaces have their capacity well taken for the first half. The leading producer of Northern iron is sold ahead as far as September, including its large undelivered tonnage which it hopes to make good if the coke supply improves. Foreign iron is again being offered in this market, dealers asking $22.35 for March delivery of a Middlesboro iron equivalent to Southern No. 3 foundry. For earlier shipments higher prices are asked. There is little demand felt for it as yet, however. Contracts for several thousand tons of malleable Bessemer for forward deliveries were placed during the week. Melters of malleable iron are experiencing considerable difficulty in making good the losses on their contracts, as a result of the frequent banking of the local furnaces, and are forced to buy standard Bessemer, which is being offered by Mahoning and Shenango Valley furnaces for quick delivery at $24.50 Chicago. The demand for this in the week under review has been active. We quote as follows, the maximum price being for delivery in the second quarter; the minimum for the second half:

Lake Superior Charcoal	$26.50 to 27 00
Local Coke Foundry No. 1	23 50 to 24 00
Local Coke Foundry No. 2	23 00 to 23 50
Local Coke Foundry No. 3	22 50 to 23 00
Local Scotch Foundry No. 1	24 00 to 24 50
Local Scotch Foundry No. 2	23 50 to 24 00

Southern Coke No. 1	22 85 to 23 35
Southern Coke No. 2	22 35 to 22 85
Southern Coke No. 3	21 85 to 22 35
Southern Coke No. 4	21 35 to 21 85
Southern No. 1, soft	22 85 to 23 35
Southern No. 2 soft	22 35 to 22 85
Southern Gray Forge	21 35 to 21 85
Southern Silveries (according to silicon)	27 15 to 29 15
Jackson Co. Silveries, 6 to 8 percent silicon	32 20 to 33 20
Ohio Strong Softeners	26 30 to 27 30
Alabama and Georgia Car Wheel	29 35 to 29 85
Malleable Bessemer	23 70 to 24 20
Standard Bessemer	24 00 to 24 50

BARS.—The heavy demand for steel bars, which keeps up, may be appreciated from the statement of a leading producer that its sales this month already exceed the total sales of the last three months of 1902. The buying is not confined to any one class of trade, but comes from the entire consuming public, and calls for deliveries in the first six months of the year. There is a better tone to the bar iron market. Orders are more numerous and specifications are growing in tonnage. Hoops and angles are also in good demand. We quote mill shipments, Chicago delivery, Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops, 2.16½c. Iron, f. o. b. mills, 1.75c. On lots from store, we quote steel, 2c to 2.10c; iron, 2.15c to 2.20c; hoops, 2.40c to 2.50c; angles, 2.25c to 2.50c rates.

SHEETS.—There has been a good demand for both black and galvanized sheets during the week, mills and jobbers sharing in the increased trade. We quote No. 27 black, mill shipments, 2.75c to 2.80c; galvanized, 3.35c to 3.45c; for deliveries from stock, No. 27 black, 2.90c to 2.95c; galvanized, 75 percent to 75 and 5 percent.

STRUCTURAL STEEL.—Jobbers report an exceptionally good demand for small lots from stock. Mill business has not been heavy during the week, though some good sized transactions are under way. The Santa Fe Railroad has under consideration the placing of an order for 3,000 freight cars with steel underframes. Should the latter be specified, about 16,000 tons of steel, mostly heavy sizes, will be required. We quote mill prices, Chicago delivery, for beams, 15 inches and under, 1.75c to 2c; 18 inches and over, 1.85c to 2.10c; universal plates, 1.75c to 2c; angles, channels and tees, 1.85c to 2c base. The mixiimum quotation represents the price for quick delivery. On lots from store cut to length, we quote 2¼c to 2½c per pound.

BILLETS.—Though there are inquiries in the market for domestic and foreign billets, no sales of any consequence have been made during the week. We quote domestic Bessemer billets, $35; for small lots from stock, 4x4, $40; open-hearth billets for forging purposes, $37 to $40, according to tonnage and point of delivery; for use in rolling mills, $33.50 to $34. German basic Bessemer billets are offered at $27.25 to $27.50 at Atlantic ports, duty paid, for round lots—5,000 tons and upwards—of one size and one carbon. Special carbons are higher, according to specifications and quantity.

RAILS AND TRACK SUPPLIES.—There are frequent inquiries for heavy sections from steam and electric roads, and several contracts have been placed for late deliveries with mills. There is a good demand for light rails and track supplies. We quote standard sections, $28; second quality, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $40 to $41, with regular differentials for intermediate sizes. Track supplies, mill shipments, are quoted as follows: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c; (Out of store, 2.40c to 2.50c rates); second quality, 2.15c; track bolts, 3½x3¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

MERCHANT STEEL.—Mills continue to labor under a heavy press of specifications. New business is of light proportions, owing to the crowded condition of producers. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c, flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 to 10 percent higher; cold rolled shafting, carload lots, 47 percent off, Chicago; less than carload lots, 42 percent off, Chicago.

CAST IRON PIPE.—Buying is limited to such small lots as are required for repairs or completing stocks. The leading producer is suffering from a scarcity of cars at its Southern plants, and has about 300 carloads of material stocked in its yards which should have been shipped out weeks ago. We quote f. o. b. Chicago, 4-inch water pipe, $35; 6-inch, $34; 8-inch and upwards, $33; gas pipe, $1 a ton higher.

PLATES.—There is an active demand for plates from stock, and owing to the withdrawal from the market of the leading local producer, a large demand has been turned to warehouses. The local mill contemplates opening its books for deliveries in the last half of the year shortly. We quote mill shipments, Chicago delivery, tank steel ¼-inch and heavier, 1.75c to 2c, base; flange steel, 1.85c to 2.10c. Prices from stock: Tank steel, ¼-inch and heavier, 2.25c to 2.35c; 3-16, 2.35c to 2.40c; No. 8, 2.40c to 2.50c; flange steel, 2.50c to 2.60c.

WIRE NAILS, FENCING, ETC.—The movement of all kinds of wire products is very good, wire nails, barb wire and poultry netting being particularly active. Supplies in jobbers' hands are low and below what they were a year ago. The entire product of producers goes into immediate consumption, and mills are unable to accumulate any stocks. Excepting those dealers located at points in the West to which reduced freight rates prevailed in December and who took advantage of the lower prices to lay in material for the spring trade, few jobbers and retailers have covered for their spring requirements. These are buying actively at the present time on the basis of advanced prices. By an error in our last report it was stated that prices had been advanced $5 a ton; it should have read $2 a ton. We quote to jobbers, carload lots, Chicago delivery, as follows: Smooth wire, annealed, 1.95c; galvanized, 2.25c; painted barb wire, 2.35c; wire nails, 2.05c; cut nails, 2.15c; polished staples, 2.20c; galvanized staples, 2.50c. Prices to retailers are 5 cents higher than above quotations on carload orders, and 15 cents higher on less than carload lots. Poultry netting is quoted at 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 lbs.

COKE.—Much uneasiness is felt locally over the coke outlook. Receipts during the past week, owing to the heavy fall of snow, diminished considerably, and left furnaces with barely enough fuel to operate. Strenuous efforts are being made both by railroads and dealers to move shipments forward more rapidly, but without any appreciable results. Dealers are refusing to accept orders for forward deliveries until some improvement is to be seen in the present condition. Spot coke sells readily at $10 to $10.50 for Connellsville. We quote for forward deliveries, $5.25 to $5.50 at the ovens.

OLD MATERIAL.—Demand for scrap in this market is almost nil. Local mills are not buying from local dealers, but are sending their representatives into the country to buy direct from merchants and firms having material to sell. This is because of the high prices asked by Chicago merchants. We quote as follows, gross tons:

Old Iron Rails	$24 00 to 24 50
Old Steel Rails (mixed lengths)	18 50 to 19 00
Old Steel Rails (long lengths)	23 50 to 24 00
Relaying rails	31 50 to 32 00
Old wheels	23 50 to 24 00
Heavy melting steel	18 00 to 18 50
Mixed country steel	15 50 to 16 00

The following are selling prices per net ton:

No. 1 R. R. wrought	$21 00 to 21 50
No. 2 R. R. wrought	18 50 to 19 00
Shafting	19 00 to 19 50
Dealers' forge No. 1	17 00 to 17 50
No. 1 busheling and wrought pipe	14 00 to 14 50
No. 1 Cast	17 00 to 17 50
Railway malleable	16 00 to 16 50
Country malleable	15 00 to 15 50
Iron axles	23 50 to 24 00
Steel axles	19 50 to 20 00
Cast borings	10 50 to 11 00
Mixed borings, etc	10 50 to 11 00
Wrought turnings	14 00 to 14 50
Machine shop turnings	13 50 to 14 00
Iron axle turnings	14 50 to 15 00
Steel axle turnings	14 00 to 14 50
Stove plate and light cast scrap	13 00 to 13 50
Old iron splice bars	21 00 to 21 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, JAN. 14.

Buyers are still reluctant about placing orders and are insisting that prices will be lower. The reason given for their belief is that, judging from the experience of many years, prices have been maintained for six months at a level which can not be permanent and that they consider the time for a change is near. This argument seldom results in the buyer getting quotations which suit him and the volume of business now being transacted is not large.

IRON ORE.—There have been some inquiries for ore for the coming season, but ore interests are not naming prices and probably will not be ready to do so for a week or two. Some sales from dock at last year's prices are being made, recent buying including ore for use in Virginia furnaces.

COKE.—Delivery has improved slightly. Prices remain at $8 at ovens for spot and $5.25 for the first half, for foundry coke. The uncertainty as to how soon ovens now being built will be producing and as to the ability of railroads to deliver coke has a tendency to prevent contracts for longer than the first half from being made.

PIG IRON.—The market is very quiet. While a fair number of inquiries, some extending into the third quarter, are being received, sales are neither large nor numerous. Especially in spot is the market dull, but prices continue on a basis of $24.75 for No. 1 Northern. For No. 2 Southern for prompt delivery $24.35 is the Cleveland price, while for the first half the price is $1 to $1.50 lower. Northern gray forge offered at $20.50 at the furnace has not been sold and very few sales are being made at any price, so that it is difficult to give the market price. For the second half, prices of Northern iron are still on a basis of $22.85, Cleveland, for No. 1 foundry, and $21.85 for No. 2. We quote domestic irons as follows, f. o. b. Cleveland, for shipments in the first half of 1903:

Bessemer	$21 75 to 22 25
No. 1 Strong Foundry	23 00 to 23 50
No. 2 Strong Foundry	22 50 to 23 00
No. 3 Foundry	21 75 to 22 25
Scotch No. 1	23 00 to 23 50
Scotch No. 2	22 50 to 23 00
Gray Forge, Valley	20 00 to 20 25
Lake Superior Charcoal	27 50 to 28 00

FINISHED MATERIAL.—Business is slack compared with this time last year, but compares favorably with ordinary years. Sales agents and jobbers are, as a rule, holding firmly to their prices in spite of insistent efforts of buyers to obtain concessions. Bar iron presents a perplexing problem to one who is endeavoring to ascertain quotations with any degree of exactness. The principal producers, especially the company which turns out the widest range of sizes, are making a determined effort to maintain prices. Contradictory reports are heard. While one large producer declined to take an order for 2,000 tons because the buyer demanded a lower price than 1.70c, Pittsburg, and possibly obtained the iron elsewhere at the price he was willing to pay, sales have been made as high as 1.75c, Pittsburg. Fair business is being done in steel bars at 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg. Agreement quotations on structural material have been revised as follows to conform to increased charges for freight: Beams and channels, 3 to 15 inches, 1.70c; 18 to 24 inches, 1.80c; tees, 1.75c; zees, 1.70c; angles from 3 to 6 inches, 1.70c; universal mill plates, 1.70c.

Sheets are weak and, although the quotations of the principal producers have not been changed, buyers are not charged more for delivery on account of recent increase of freight rates. Cutting by independent companies is still very much in evidence. The prices of the distributors of the product of the principal producer, are as follows: For 3-16-inch sheets and heavier, 2.10c to 2.15c, Cleveland. Mill sales of black sheets, Cleveland, to consumers: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c; and the following prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.55c to 2.70c; Nos. 18-20, 2.75c to 2.90c; Nos. 22-24, 2.85c to 3c; Nos. 25-26, 2.95c to 3.10c; No. 27, 3.05c to 3.20c; No. 28, 3.15c to 3.30c. On galvanized sheets we quote mill sales in carload lots, Cleveland, as follows: Nos. 10 and 11, 2.60c to 2.75c; Nos. 12-14, 2.70c to 2.85c; Nos. 15-17, 2.80c to 2.95c; Nos. 18-21, 3c to 3.15c; Nos. 22-24, 3.30c to 3.45c; Nos. 25-26, 3.55c to 3.70c; No. 27, 3.80c to 3.95c; No. 28, 4.05c to 4.20c; No. 29, 4.45c to 4.60c; No. 30, 4.95c to 5.10c. Galvanized sheets out of stock are quoted at 75 and 2½ off.

OLD MATERIAL.—The more cheerful feeling among dealers in scrap, noted last week, continues. Prices are firm and a larger amount of business is being done. We quote Cleveland prices, all gross tons, as follows:

Old iron rails	$24 00 to 24 50
Old steel rails (over 6 feet)	22 00 to 23 00
Old steel rails (6 feet and under)	21 00 to 22 00
Old car wheels	20 00 to 21 00
No. 1 R. R. wrought scrap	20 00 to 21 00
Mill scrap	19 50 to 20 00
No. 1 machine cast scrap	21 00 to 21 50
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	18 50 to 19 50
Wrought turnings (free from cast)	16 00 to 17 00
Cast borings	11 00 to 12 00
Uncut wrought iron boilers	12 00 to 13 00
Steel boiler plates	17 00 to 18 00
Grate bars	12 00 to 13 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	15 50 to 16 50
Malleable iron (railroad)	20 50 to 21 50
Malleable iron (agricultural)	17 50 to 18 00
Stove plate	15 50 to 16 50
Heavy steel	19 00 to 20 00

CINCINNATI.

Jan. 13.

The market has made but little change the past week. Coke continues firm with no change in prices. We quote spot coke $7 to $7.50, and for contracts running through the balance of the year $5.50 to $6 at the ovens for foundry coke. In finished material trade has been rather quiet with the market steady. Old material is easier.

PIG IRON.—The characteristic of the market the past week has been irregularity. No two sales agents make the same report as to their experiences. In a general way there is no change in quotations. The demand has been fair and mainly for spot or quick shipment iron. Contracts for the first half of the year are scarce, and for the second half there is practically no buying. The minimum price, at which No. 2 foundry for spot shipment is selling, appears to be about $18.75 Birmingham, with $18.50 the quotable minimum price for the first six months. Some furnaces hold views well above these quotations. In gray forge the same firm feeling prevails in a general way which was noted last week, and sellers' views are mainly represented by $17 to $17.50 Birmingham. At the same time forge iron was offered at $16.50 without effecting a sale, the buyer stating that he could purchase for less. It is believed, however, that users of gray forge are not well covered for their next six months' supply, and that firm holding will result in sustaining the market. Buyers of all grades understand the irregularity in prices and are not purchasing to any extent without testing the market and this adds to the choppy condition of prices. It has developed recently that No. 1 foundry and No. 1 soft are a little more plentiful. Some furnaces are now making a difference of only 50c per ton in prices between No. 1 and No. 2 foundry. It is reported that Southern car wheel charcoal iron is finding an improved demand. A sale of 2,000 tons for deliveries running through the next eight months is noted at private terms. It is reported here today that the Southern furnaces held a meeting in New York on Jan. 9, and that the price of No. 2 foundry was fixed at $19 Birmingham, to be in force from February to December. The parties to this agreement are said to have been as follows: The Alabama Consolidated Coal & Iron Co.; the Tennessee Coal, Iron & Railroad Co.; Sloss-Sheffield Steel & Iron Co.; Roane Iron Co.; Chattanooga Furnace Co.; Lacey-Buek Iron Co.; Virginia Iron, Coal & Coke Co. In view of the conditions now prevailing it is believed to be doubtful if this figure can be maintained. We quote for quick delivery and first quarter of 1903, f. o. b. Cincinnati:

Southern Foundry No. 1	$22 50 to 23 50
Southern Foundry No. 2	22 00 to 22 50
Southern Foundry No. 3	20 75 to 21 25
Southern Foundry No. 4	19 75 to 20 75
Southern Foundry No. 1, soft	22 50 to 23 50
Southern Foundry No. 2, soft	22 00 to 22 50
Gray Forge	19 75 to 20 75
Northern Foundry No. 1	25 15 to 25 65
Northern Foundry No. 2	24 15 to 24 65
Southern car wheel iron	27 75 to 28 75

FINISHED MATERIAL.—There is no change in the situation and trade is fair at current prices. Orders are still for moderate quantities to cover immediate needs. In merchant pipe the demand continues fair and trade is running along in a normal way. There are no indications of price disturbances. The trade is waiting for spring specifications and at this time there is but little room for comment. We quote black sheets No. 27 at 2.75c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.20c; No. 27, 3.10c; No. 16, 2.75c; No. 14, 2.65c; No. 12, 2.55c; No. 10, 2.45c. Galvanized sheets, car lots, sell at 75 and 10 percent off; less than car lots, 70 and 10 percent off. The cutting in sheets continues and independent mills in this district are actively competing with the leading producer. Tank plates out of store are quoted at 2.25c for ¼ inch and 2.35c for 3-16 inch. Prices for bar iron in carload lots are: 1.80c base, half extras f. o. b. Cincinnati; steel bars, 1.72c base, half extras f. o. b. Cincinnati. Both are retailed at 2c base, half extras, out of store. Beams and channels are quieter, with deliveries better because of the closed season. We quote: 2¼c to 2¾c, from stock, and angles at 2.15c to 2.25c for base sizes. Merchant pipe and boiler types are quoted as follows for carload lots f. o. b. Cincinnati:

MERCHANT PIPE.

(Basing discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜-inch	66.8	56.8	63.8	53.8
½-inch	68.8	58.8	65.8	55.8
¾ to 6-inch, inclusive	73.8	63.8	70.8	60.8
7 to 12-inch, inclusive	71.8	61.8	68.8	58.8

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ in	43.8 & 5	38.8 & 5
1¼ to 2½ in	56.3 & 5	36.3 & 5
2¼ to 5 in	61.3 & 5	46.3 & 5
6 to 13 in	56.3 & 5	36.3 & 5

OLD MATERIAL.—The market is quiet and a shade easier, with quotations for old rails lower. We quote as follows:

Old No. 1 Wrought Railroad, net tons	$19 50 to 20 00
Cast Machine and Foundry, net tons	16 50 to 17 00
Old Iron Rails, gross tons	22 50 to 23 00
Old Steel Rails, gross tons	21 50 to 22 00
Old Short Lengths, gross tons	17 50 to 18 00
Old Iron Axles, net tons	26 00 to 27 00
Old Chilled Car Wheels, gross tons	21 50 to 22 00
Stove Plate, net tons	11 50 to 12 00
Wrought Turnings, net tons	15 00 to 15 50
Cast Borings, net tons	12 00 to 12 50

NEW YORK.

OFFICE OF *The Iron Trade Review.*
ROOM 1909, NO. 150 NASSAU ST., Jan. 13.

PIG IRON.—The waiting policy created by a belief in lower prices continues; yet several sales agents report inquiries from foundrymen who have not as yet made full provision for the material they will need to fill contracts now on their books. Among them was a foundryman who turns out castings to the extent of about 160,000 tons yearly. This concern had fully determined to buy only as imperative needs required, because of its strong belief in lower values. Since the new year opened orders have come in so plentifully that it will cover the balance of its requirements for three months and is now negotiating for several thousand tons of German iron. The latter, judging from reports, is fast gaining in popularity with Eastern foundrymen. A serviceable grade can be had in large lots at about $20, New York delivery, duty paid. The analysis is as follows:

Manganese	0.90 per cent.
Sulphur	0.90 percent
Phosphorus	0.70 percent
Silicon	2.50 to 3.00 percent
Carbon	3.40 to 3.80 percent

Middlesboro No. 3 is figuring largely in inquiries nowadays also. It is stronger than in weeks, and is obtainable at $17.50 to $18 in large lots, New York delivery, duty paid. The firmer market for English iron is due to a hardening in freight rates, caused by the renewed negotiations for foreign coal for Eastern localities. Scotch irons are quiet, but strong, with reports of dissatisfaction growing more numerous.

In American irons, the feature is the eagerness displayed to locate carload lots, and the little or no reluctance to accept sellers' prices. Premiums for spot iron are in evidence again. This is due to delays in the deliveries on old contracts, both on the part of Northern and Southern furnaces.

The coke situation is giving particular annoyance to Eastern foundrymen just now. The supply falls far short of requirements, and the price is $7 to $8 at the ovens. It is thought here, however, that it ought to fall to $5 at the ovens about April. We quote: No. 1 X Northern, $23.25 to $24.25; No. 2 X, $22 to $22.75; No. 2 plain, $21 to $21.75; Southern No. 1 foundry, $23 to $23.50; No. 2 foundry, $22 to $22.50; No. 3 foundry, $21.50 to $22; No. 4 foundry, $20.50 to $21.

BILLETS.—So many conditions are imposed as regards delivery that an accurate quotation is hard to obtain. Large lots of foreign steel are said to be obtainable at $27.25 to $28.

RAILS.—An excellent inquiry is noted since the new year opened. The orders have been no higher than 2,000 tons at a time as a general rule, but they have been so numerous as to make a large tonnage. While mills have considerable orders booked, we are authoratatively informed that there is no truth in the reports that these exhaust their capacity for the year.

FINISHED IRON AND STEEL.—Orders have come in for small lots, but representing an excellent tonnage. Inquiries are more numerous than for weeks, railroads being largely represented. Some large orders in structural material are expected in the near future from St. Louis, in consequence of the World's Fair. The Railway Terminal Association of that city recently increased its capital from $15,000,000 to $50,000,000, in order to make improvements, which will require a large amount of structural material. In a previous report we noted how it had placed an order for 9,500 tons with the American Bridge Co. The majority of mills have enough orders on their books to take them seven months to fill. Plates taking orders. Sheets are slightly better. Bars are without special feature. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; fire box, 2.30c to 2.50c; refined iron bars, 1.95c to 2c; soft steel bars, 1.95c to 2.10c; steel sheets, in carloads, New York, No. 28 black, 3.05c to 3.10c; galvanized, 75 and 7½ off.

PHILADELPHIA.

Jan. 13.

While lower prices are not expected, at least in the first half of this year, sales are not being made rapidly. More pig iron is turned out, but the output can not be increased to a much greater extent unless railroad conditions improve more than is expected. Imports of pig iron are heavy. The general prospect is excellent.

PIG IRON.—Inquiries are coming in freely, but sales are light. There is nothing to indicate any decided change in the market for several months. Owing to the resumption of coal shipments, ocean freights will probably be higher. This will almost certainly be true if coal is placed on the free list. Cargo lots of Middlesboro No. 3 can be purchased at $17 to $17.50, but from $3 to $4 more is asked for prompt delivery of small lots. German sells at $20 per cargo lots. Domestic, for delivery in buyers' yards, we quote as follows: No. 1 X foundry, $24 to $25; No. 2 X foundry, $22.50 to $23; No. 2 plain, $21.50 to $22; gray forge, $20.50 to $21.50.

FINISHED MATERIAL.—Many mills are closed on account of inability to get coal. Prospects for the near future are not encouraging. Business is dull. Prices are as follows: Plates, small lots, 2.10c to 2.15c; carload lots, ¼-inch and thicker, 2c to 2.05c; universals, 2c to 2.05c; flanges, 2.10c to 2.20c; firebox, 2.25c to 2.30c; marine, 2.30c to 2.35c. Bars—Steel bars, 1.80c to 1.85c; prompt shipments from local mills, Western steel, 1.75c to 1.80c; bar iron, 1.92c to 1.95c for carload lots as minimum quantity. Structural material—Small sizes, 1.73½c to 1.80c; large sizes, 1.90c to 2.10c.

OLD MATERIAL.—Owing to many mills being closed, demand

for scrap is limited, but prices show little change. We quote as follows: Old steel rails, $20.50 to $21.50; miscellaneous heavy steel scrap, $20 to $20.50; low phosphorus scrap, $26.50 to $27.50; old steel axles, $25 to $26; old iron axles, $28.50 to $30; old iron rails, $23.50 to $24; old car wheels, $20 to $21; choice scrap RR. No. 1 wrought, $22.50 to $23.50; country scrap, $20 to $21; machinery cast, $19.50 to $20.50; No. 2 light scrap (forge) $18 to $18.50; No. 2 light scrap (ordinary), $14 to $15; wrought turnings, $16 to $16.50; wrought turnings, choice heavy, $16.75 to $17; cast borings, $10 to $10.50; stove plate, $15 to $16.

BIRMINGHAM, ALA.

Jan. 13.

The first two weeks of the new year have seen very little activity in the iron market in the South. Some good sales have been made of coke iron, but no very large tonnage in the aggregate. Chief interest the past week has centered in a meeting of the Southern Association of pig iron manufacturers held in New York. At this writing nothing has been given out of the action, but it is thought that the minimum prices heretofore announced, based on $18.50 Birmingham for No. 2 foundry for the last half of 1903, will not be changed.

The manufacturers of charcoal iron report some good sales. Some of the largest users of charcoal iron are known to have covered their expected needs for the last half, at prices ranging from $23 to $24 f. o. b. Birmingham. There has been relatively little increase in the output of charcoal iron the last several months, and in view of the increasing demand from the car manufacturers, there is little doubt that in the next sixty or ninety days all the charcoal iron the makers think safe to sell ahead will have been placed.

Coal and coke continue in active demand. Some of the foundries find it quite difficult to keep in supply of coke, as the demand from the furnaces is as great as the coke ovens can supply, or greater. The ruling prices are $6 to $6.50 f. o. b. ovens, for coke, while run-of-mine coal is bringing $1.75 to $2 at the mines.

The Alabama Consolidated Coal & Iron Co. has announced that if its present plans are carried out it will build another new furnace this year, open new coal mines with a capacity of 1,000 to 1,500 tons per day, and build several hundred additional coke ovens.

One of the Alice furnaces of the Tennessee company, which has been out of blast for some weeks undergoing repairs, is reported about ready to resume operations. It is understood that the Sloss-Sheffield company will put out its Philadelphia furnace at Florence this week for general repairs.

It is understood that the Southern Iron Committee will hold a meeting at an early date to consider the question of advancing freight on pig iron. An advance of 50 cents to Ohio River points became effective Sept. 15, and it is understood the iron manufacturers will vigorously oppose any further advance, as the additional 50 cents already imposed, together with the advances north of the Ohio River, makes the delivered price of iron in Chicago and other Northern points 70 to 80 cents higher than six months ago; in other words, so far as the iron maker is concerned, this is equivalent to adding that much per ton to his cost. It is understood that an effort will be made to have the railroads refund 50 cents per ton on the iron left on the yards Dec. 31, and which could not go forward on old billing orders by reason of lack of cars.

The Christensen Engineering Co. has opened an office in the Merchants' Loan & Trust Bldg., Chicago, for the sale of its "Ceco" electrical machinery. The company has secured the services of Chas. G. Burton as the manager of the agency. Mr. Burton is well and favorably known in the electrical field through his connection for several years with the Central Electric Co., and later for three years with the Westinghouse Electric & Manufacturing Co. He left the latter company in the early part of 1902, to install a power and transmission system.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM NO 1909, 150 NASSAU ST., Jan. 13.

PIG TIN.—The pig tin situation continued strong until yesterday, when a slight decline took place. As has been the case for weeks past, the market was entirely given over to manipulation. There is not a single development to warrant the strength the market has recently displayed. Recent quotations are slightly higher than those of a week ago. The London market has been particularly strong, and at one time yesterday, spot sold at £28 10s, which was nearly £8 higher than closing quotations this time last week, but today prices are a little lower. Closing quotations at the Metal Exchange today were as follows: Spot to January, 28c to 28⅛c; February to April, 28c to 28¼c. London closing's follow: Spot, £127 17s 6d; futures, £128 2s 6d. Arrivals for the month to date at Atlantic ports amount to 1,040 tons, with 2,570 tons afloat.

COPPER.—Taken as a whole, values are about the same as a week ago. The feature of the week was a sale made today on the Metal Exchange of 50,000 tons of casting at 12c, deliverable in February. Offerings at the same price, and in still larger quantities, were not taken. The firm tone of the market is a surprise in trade circles, in view of the fact that surplus stocks are increasing at the rate of at least 6,000 tons monthly, and the statistical situation, as revealed by the annual report of United States copper statistics, is so unfavorable. In Wall Street reports in both directions are the reverse, which accounts for the strength of copper shares recently. In London, the market has been strong. Closing prices today on the Metal Exchange were as follows: Lake, 12¼c sellers; electrolytic, 12⅛c sellers; casting, 12c sellers; standard, 11½c nominal. London closed today as follows: Spot, £53 5s; futures, £53 10s. Exports for the month to date aggregate 3,215 tons, which is about one-half of what they were at this time a week ago.

PIG LEAD.—Lots of 50 tons or more still rule at 4.12½c. The market in St. Louis is without change at 3.97½c. London is slightly higher at £11 5s.

SPELTER.—Has been considerably stronger during the week, than for some time past, and the price for spot has advanced some 30 points since our last report, because of manipulation. At this writing it is quoted at 4.90c to 5.10c for any delivery up to March. St. Louis is stronger also at 4.75c, recent advances being about 40 points. London is a shade higher at £20.

ANTIMONY.—Prices are without change, Cookson's commanding 8¼c to 8½c; Hallett's, 7c to 7¼c; and other brands, 6¾c to 7c.

NICKEL.—Unchanged. Prices average 40c to 60c, according to quantity.

QUICKSILVER.—Jobbers only are in the market, and sales have been made on the basis of $48 per flask in lots of 100 flasks. London, £8 15s.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Jan. 13.

There is a better tone to the market, though buying is not very heavy. Copper is firmer. Spelter has also improved and prices are more stable. Sheet zinc and pig tin are stronger. The old metal market is quiet. We quote jobbers' prices as follows:

Lake copper, carload lots, 12⅛c; less than carload lots, 12¼c to 12½c. Pig tin, 29c; pig lead, carload lots, 4.10c; less than carload lots, 4½c. Sheet zinc, carload lots 6¼c, and 6⅜c in lots of 600 pounds. Spelter, carload lots, 4.45c; less than carload lots, 5c to 5½c. Antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's in small quantities. Nickel, 5c to 6c, according to size of order and delivery. Selling prices of old metals are as follows: Copper wire, $10.50; heavy copper, $10.50; light copper, $9.50; red brass, $10.50; yellow brass, $7.75; light brass, $6.50; lead pipe, $3.90; zinc, $3.80.

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JANUARY 15, 1903

JOBBERS AND "INDEPENDENT" MANUFACTURERS.

We have adverted several times in the past year to the position of the jobber in finished iron and steel products. Recent events have served to throw further light on the rather vexed problem of the jobber's ultimate position. On the surface it appears that this is dictated by the producer, but that is simply the immediate influence. Controlling influences are more distant, and various actions of manufacturers from time to time are really simply the interpretaton of these influences. In citing the action of manufacturers with respect to jobbers we do not wish to be understood as taking the ground that the manufacturer arbitrarily formulates rules and regulations, but rather that he follows general developments in the trade, interprets them, and exerts a modifyng influence.

The general development has been that the jobber can control a large consuming trade, that he can distribute to better advantage than a very large producer, and that the so-called "independent" manufacturer is a competitor of the jobber. The independent mill must necessarily do a jobbing or even retail business. Its salary and office expense is much heavier per ton of output than that of the large corporaton. Part of such expense can be balanced by utilizing the force to do a jobbing or retail business.

The influence of these developments has been to lead the large producers to favor more and more the large jobber. In some cases recognition came first of the jobber in general, and later special recognition of a few large jobbers. At one time the leading sheet interest sold almost indiscriminately; later it recognized moderately large buyers, and more recently it has recognized in particular the very large distributors. The leading tin plate interest has steadily drawn the lines closer and closer as to what class of trade it would sell to, and has in addition increased the margin allowed, although this is still so small that the official price of tin plate does not really represent the price at which an ordinary small purchaser can buy, the jobber necessarily asking a trifle higher price. This conditon may well be recognized in the not distant future by an advance in the regular or open price. The pipe and tube interest has likewise been recognizing more exclusively the large distributor.

The latest development in the problem of the jobber came with the wire announcement at the opening of the year, it being understood that with the new list a great many small jobbers will no longer be able to buy at the jobbing price, such small so-called jobbers, employing possibly half a dozen traveling men, being classed as retailers, thus throwing more trade to the large distributor.

All developments have been in the line of throwing trade to the large jobber, who may be said to be on trial. If the present system, as further amplified, proves satisfactory, the problem will have been solved; otherwise, intermediate positions having been tried and abandoned, the logical outcome would seem to be that the large producers would go to the other extreme, and become actual distributors themselves.

Cordial and profitable relations between the large producers and large distributors would be improved by a more thorough recognition on the part of the latter class that the small independent producer is strictly a competitor. He buys a lot of steel in one semi-finished form or another, and distributes the more finished form, much the same as a jobber buys a large lot of goods and breaks bulk. The small producer goes only slightly further, in that he performs one manufacturing stage. The transactions are not greatly different.

In one of the letters from leading machinery and metal-working concerns which appeared in our issue of Jan. 1, the sentence occurs: "We are quite apt to compare present prices with those that obtained at some past time when such prices were unproductive of profit." There is a great deal of truth in this statement and particularly a good deal of pertinence in the reference to the unproductive prices of some years back. It is entirely misleading to compare the prices of prosperity with those of a period of industrial prostration, when loss was the rule and profit the exception. Referring to present prices in iron and steel, it needs to be remembered that while they are well above the level of $9.75 Bessemer pig iron and $13.75 steel billets, the period of reaction which all authorities look for sooner or later, is not likely to bring us to the extreme depth but to some intermediate point. Profitable operation would be possible, with considerable shrinkage from todays' prices, but that would involve shrinkage all along the line—in ore, coke, labor, freights, every factor of present day cost. Such a re-adjustment will come in time, but it will not necessarily involve distress; for 1900 brought a marked fall in iron and steel prices, with no serious interruption to prosperity. It is to be said of today's prices, both in machinery and in finished iron and steel, that they do not represent a toppy condition, from which the only relief is in a plunge. And those who measure the altitude by taking profitless prices as the base need to recall all the conditions that attended these minimum prices in our iron and steel history.

Fire which started in the stamping department of the McClary Mfg. Co.'s plant at London, Ont., Jan. 9, caused a loss of 300,000.

A COURT DECISION ON MESABI FLUE DUST.

The bill in equity filed against the Jones & Laughlin Steel Co., of Pittsburg, by the residents of the Oakland district of that city to enjoin the steel company from operating its Eliza furnace plant on account of the large amount of ore and flue dust escaping from the stacks and, according to the allegations of the plaintiffs, resulting in the depreciation of property values, was dismissed this week. However, the right to sue for damages has been reserved to the residents of the district. We take the following interesting extract from the decision of the court:

"While the extent of the injury resulting to plaintiffs from the dust can be ascertained, the injury resulting to defendant by a decree prohibiting the use of Mesabi ore in its furnaces cannot be estimated. Such a decree would practically mean the shutting down of not only its furnaces, but also its iron and steel works, representing together a capital of at least $60,000,000, and the employment of nearly 11,000 persons. The effect of a restraining order would not be confined to the defendant company, because if it is unlawful for defendant company to use Mesabi ores, it is also unlawful for every other furnace in this county to use those ores; and injunction, therefore, in this case would affect injuriously every one of the 37 blast furnaces in Allegheny county, and their allied industries, with capital as shown by the industrial statistics of the commonwealth, aggregating $400,000,000, and employing 60,000 persons. As there are not sufficient 'old range' ores mined to supply the demand if the exclusive use of those ores be required, a decree which makes the use of Mesabi ores impossible, means the shutting down of every blast furnace in the county within a year, as the supply of old range ores would be exhausted within that time. What that would mean to the people of this city and county needs no argument. The damage would be inestimable. If the defendant company's furnaces were located in a residence community, or, if it was using a material not generally used in other furnaces, or, if its furnaces were improperly constructed, or were negligently operated, or if, by a reasonable expenditure of money upon its furnaces the injury complained of might be avoided, we would have before us a different question."

Negotiations for Claire and Sharpsville Furnaces.

For more than a month negotiations have been pending between W. P. Snyder & Co., of Pittsburg, and Perkins & Co., Ltd., and the Sharpsville Furnace Co., of Sharpsville, Pa., for the leasing of the furnaces of the two companies located at that place known as the Mable and Sharpsville respectively. The leases were to have been closed several days ago but owing to unforseen complications the matter has not yet been adjusted. Should W. P. Snyder & Co. secure the leases on these properties there will be no change with their intention of erecting two additional stacks at Sharpsville, Pa., plans for which are now being prepared. W. P. Snyder & Co. now control and sell the product of the two furnaces of the Shenango Furnace Co. at Sharpsville and the Spearman stack at the same place which was taken over a year ago. The two furnaces for which leases are now pending have an annual output of about 150,000 tons and are in operation at the present time.

The Republic Iron & Steel Co. this week closed a contract with the Pittsburg Coal Co., of Pittsburg, for its entire coal supply for the next three years for its Ohio and Pennsylvania mills. The contract calls for the delivery of more than 1,000,000 tons and is one of the largest placed in some time.

The Vulcan Crucible Steel Co., of Pittsburg, whose plant is located at Aliquippa, Pa., is considering plans for doubling its output of crucible steel, by adding a new floor containing 30 additional pots. The company is now completng its open-hearth plant and the additional mills installed will be placed in operation early in March.

TIN PLATE, SHEET AND HOOP WAGE SCALES.

The Amalgamated Association will not sign scales this year with the American Tin Plate Co., American Sheet Steel Co. and the American Steel Hoop Co., subject to ratification at the annual conventon, as was the case last year. During the latter part of February, 1902, the scale basis for these three lines was taken up and early in March provisionary scales were signed containing no change in prices. These scales were ratified in convention but minor changes were made in the foot-notes in two of them. The annual conventon will be held in Columbus beginning Tuseday, April 12 and it is believed that all scale matters can be adjusted during the months of May and June, thus precluding the necessity of closing the mills pending a scale adjustment.

No advances will be asked by the tin plate, sheet or bar iron workers although a few of the individual lodges are in favor of advancing the base in these separate lines, believing that they should share the advances made other crafts during the past six months. Suggestions to be incorporated in the convention program are now being received by the officials of the association and it is believed that when all suggestions are in on Feb. 17 it will appear that many lodges favor an advance. However the officials of the association believe that the present base in these lines is sufficiently high and their strength in the convention will preclude the possibility of demanding advances.

In sheets and tin plate the selling prices are below the wage basing prices of the scales while the bar iron workers have had their wages advanced with the advances made in the selling price of the product. The scale base on tin plate is on a selling price of $4.20 per 100 pounds of coke plates, although the present market price is $3.60, while the base on sheets is 3 cents for 28 gauge although the market today is 2.75c. The present indications are that no difficulties will be encountered in readjusting the scale for 1903-1904 and that with the exception of a few possible changes in the footnotes the scale will be practically the same as the one under which the Amalgamated Assocation members are now working.

Specifications for Cast Iron and Finished Castings.

Announcement is made by Walter Wood, chairman, and Richard Moldenke, secretary, of the appointment of their committee on Standard Specifications for Cast Iron and Finished Castings, and its authorization by the International Association for Testing Materials and the American Society for Testing Materials. The work so far outlined includes the preparation of standard specifications for testing pig iron, car wheels, pipe, the iron entering into machinery, jobbing, electrical and malleable castings, furnace iron and such other branches of the casting trade as may require attention. A general meeting of the committee will be called shortly for a discussion of the problems involved. Chairman Wood's address is 400 Chestnut St., Philadelphia, and Secretary Moldenke's, Box 432, New York City.

The Alliance Machine Co., Alliance, O., has just completed and shipped to the Homestead Steel Works of the Carnegie Steel Co., two electrically driven traveling and tilting tables for the 35-inch beam mill. They are the largest traveling tables yet built, each being 80 feet long, and their total weight approximately 600,000 pounds. A feature of their construction is the almost entire elimination of cast iron. The tables were built to the designs furnished by the Carnegie Steel Co.

Owing to its heavy shipments of ore and grain and large receipts of coal, Duluth now holds first place as a lake port, with Cleveland second. The tonnage figures are as follows: Duluth, 10,285,815 tons; Cleveland, 9,873,848 tons; Buffalo, 9,727,304 tons; Milwaukee, 9,097,468 tons; Chicago, 8,722,905 tons. A year ago Chicago was second in the list, and two years ago was first.

A MOLDER'S VIEW OF ARBITRATION.

A fight occurs on the street. Twenty persons see it, and should each one of the twenty be asked afterward to give an account of the affray, there would be twenty different statements as to how the fight began and as to how the first blow was delivered. To see the fight as it actually was you must see it as the twenty saw it. A workingman, on his way home after a day of hard work, tired, weary and irritable, sees the man for whom he works pass by, seated on the comfortable cushions of an easy carriage. His irritation is increased by the sight of the silver-mounted harness of the spirited horses, the insolent leer of the pompous coachman and the clouds of dust he must endure. This the workingman sees, but what he does not see is the manufacturer, who, after a light repast, after the social duties of the night have been performed with a smiling exterior, retires to his study and with the mask removed, sits there with careworn brow, striving to devise some economy in the working of his plant, that the recent "cut" of a competitor may be met, or else, is trying to think of some way to ward off impending disaster.

The manufacturer in his carriage sees his employe and envies him his sturdy health, his brawn and muscle and his digestive ability, and the manufacturer does not see the disappointed ambitions, the cares, worries and trials of the man he envies.

A number of competing manufacturers consolidate their interests and even though the resultant economy and the stability of the selling price of their product demonstrates the benefit of organization, they look upon the formation of an organization by their employes as an outrage. The organized employes, while resenting any incrimination against their right to organize, condemn in unmeasured terms the "trust" or capitalistic combinations.

The same feeling prevails in politics. We, who give our support and owe our allegiance to one party, can not understand how our friend, who ordinarily exhibits so much intelligence, can be convinced of the practicability of the absurd propositions advanced by the other party.

A man may not give his check to some cause which we deem most worthy, and because we do not know his charities greatly exceed our own, we call him miserly. He, looking at the case from his point of view, pities us for our misdirected effort in such an unworthy cause.

All along through life, we find the same inclination to reach conclusions from premises influenced by biased minds. Sometimes this is a matter of birth, of environment, of too close application to study along one line; and somtimes this inability to see more than one side of a question results from lack of effort. Some people do not see or think for themselves, but go along with the biggest crowd.

Governor Montague, of Virginia, when a candidate for that office, received the endorsement of nearly every labor union in that state. Shortly after being inaugurated, the street car employes of Norfolk, Va., went on a strike. An outside element took advantage of this time to commit lawless acts. Efforts by the city and county officials to maintain order not being successful, the governor was appealed to for troops to restore quiet. The soldiers were sent to Norfolk. Immediately the former friends of the governor began the passing of resolutions condemning this act.

Governor Stone, of Pennsylvania, had the same experience when the coal region was converted into a military camp.

Other governors have had the same conditions to meet and have also incurred the displeasure of some of their constituents. All because being sworn to carry out the laws of their commonwealths, they have had the moral courage to be true to their obligation.

This digression from the subject has been made to illustrate how through lack of thought the wrong side is seen and the blame placed on the wrong party. If the sending of troops to the affected regions were an act to incur our resentment, then condemn the men who framed the laws and if you have returned these same men to office without showing even by a word your disapproval, where then does the blame rest?

The same reasoning holds good in matters concerning our own organization. The convention meets and adopts a constitution. The officials are obliged to enforce and the membership to obey them, no matter what their personal opinion may be. Let the executive board in the pursuance of duty, fail to sustain some direct violation of that constitution and they become targets for all kinds of vituperation. Some few may be convinced they are right and carry with them many who do not think at all. It is this difference of thought, this seeing things from a different point of view that has suggested the idea of arbitration as a means to reconcile diverging views into a composite result that would prove satisfactory. We must admit that satisfaction has resulted in some instances, but I am convinced that the larger part of the differences settled by this method are disappointments. The fact that an adjustment has been effected by means of an outside party engenders suspicion and arouses the tendency in the minds of each to mistrust the other. Instead of a permanent peace where the employe exhibits loyalty to his employer and the employer manifests an interest in the welfare of the employe, there is either a sullen discontent or an ill concealed desire to try conclusions again.

Arbitration may be a progressive idea but can never be the panacea proclaimed by some with so much confidence. It will only be used when either of the involved parties is too cowardly to make a straight fight, or else is so dominated by an egotistical pride that the third party is called in that vanity may not be wounded or suffer a fall. Better, a great deal better, when the interested parties get together themselves with a desire to be fair, seeing in each other forces that exist and must be recognized. What a clearer perception each one gets of the other's troubles, what a better understanding of each other's needs and what a more harmonious result is obtained. Of course this plan does not always succeed and a conflict begins and continues until one is vanquished, but a fair fight seldom makes enemies.

This may be a one-sided view of the subject, but compare the results attained by arbitration, with the results attained through the method used by the I. M. U. of N. A. with the foundrymen, the Glass Workers, the Amalgamated Association of Iron and Steel Workers, and several other large labor organizations, where a policy of conciliation has been adopted, and you will agree that arbitration is not the best thing for either employer or employes.—[C. C. McCullough in Iron Molders' Journal.

The Belleville Iron & Steel Rolling Mills, Belleville Ont., which have been shut down for two years, will probably resume operations. The plant has been purchased by T. M. Kirkwood, of Toronto, and D. L. McKinnon, of Sudbury, who propose to manufacture bar iron and steel, horseshoes, cut nails, railway spikes and washers. The plant, erected in 1899 at a cost of $185,000, has been acquired for about $55,000. A bonus of $30,000 is about to be voted on by the citizens of Belleville.

The Model Brass Co., of Kalamazoo, Mich., began business Jan. 1. It makes all kinds of brass, bronze, aluminum and white metal castings. It is equipped at present to handle up to 600 pounds. The building is brick, 100x50 feet. The principal officers are Geo. Polasky, chairman, and Samuel Myers, secretary, treasurer and general manager.

The Amalgamated Association has sent out notices to all of its lodges requesting them to have all resolutions to be presented in convention to be held in convention in the hands of the program committee no later than Feb. 17. All resolutions relating to scales and changes in the footnotes must be presented through the program, as they cannot otherwise be considered in convention except by a two-thirds vote of the delegates.

LAKE SUPERIOR IRON MINES.

The Penobscot mine, Hibbing district, that has been turned to the United States Steel Corporation by its purchase of the Union Steel Co. is to be abandoned at once. Men are now on the ground taking out the pumping plant, which is the most important of its kind in the western part of the Lake Superior region, if not anywhere on the lakes. It consists of two Corliss compound condensing pumping engines, taking steam from 750-h. p., of vertical tubular boilers, and the pumps have each lifted 3,860 gallons of water a minute a height of 300 feet at minimum evaporation. There are also some half dozen other pumps in the mine, varying from 600 to 1,000 gallons capacity. A dam has been put across the drifts 100 feet above the pumps and the men are working in the bottom, taking out one pump at a time. The Hull, which lies close to the Penobscot and is 100 feet higher in its lower levels, will pump the district.

According to a Duluth paper which has had a good deal to say about the reported lease of "Section 30," work has commenced there under the direction of the fee holders, one of their number, R. H. Fagan, being in charge, according to the paper. It also states that the exploring is to be done "by the company itself, which has purchased drills for the purpose and will start two Feb. 1 and two March 1." All of which information is "important if true," and is opposed to numerous other statements made by the same paper during the past few weeks, all of which have been about as reliable as this last. It is almost unnecessary to state that the report copied above is without the slightest foundation in fact.

There is now some interest in the reported finds of iron ore a few miles back from Lake Superior near the station of Highland on the Duluth & Iron Range road. The land on which the first finds were made has been bought by Duluth and Two Harbors parties and explorations will be undertaken at once. Some very lean ore and some float has been found there, in fact for the past 20 years it has been known to exist there, and this is possibly the basis for the present investigation. The same conditions exist for many miles along the crest of the ridge separating Lake Superior from the Cloquet river.

The Cleveland-Cliffs Iron Co. has closed on several Mesabi tracts taken by it under option some months ago. These lands lie in sections 31 and 32, T. 57 R. 22, one piece being the n. e. of the n. e. of section 31 and the n. w. of the n. w. of 32, making a continuous 80 acres. This is to be called the Crosby mine, from one of the original lessees. The other property is the w. ½ of the s. w. of 31, and both are a portion of the Kinney-Hawkins-Crosby lands leased two years ago from the Mississippi Land Co., at a 20 cent royalty. The Cleveland-Cliffs Iron Co. pays an additional bonus of 7 cents a ton on all ore to be found on the lands, making settlements as the ore is found. Some very nice ore has been found on these lands and more is hoped for. The extent of the find up to date has not been great, however, the Crosby amounting to about 2,000,000 tons.

The Volunteer mine, recently transferred to the United States Steel Corporation, is to be worked heavily the coming season, and there will be a greater business on the Cascade range than for many years. The steel corporation now owns nearly all properties on the range, all but the Wheat (Corrigan, McKinney & Co.) and the Richmond (A. Maitland) and the fee to this latter is owned by the steel corporation.

From the Lake copper country mineral is going east as fast, all rail, as it did during the summer by lake, in other words no copper is being stored. The production is considerably increased over a year ago and is larger than it has been in any preceding winter.

The daily product of the Laura mine, Hibbing district, is being shipped, 250 tons to the Zenith furnace at Duluth, and 100 tons to Spring Valley, Wis.

The Niagara Iron Co., of Duluth, is to meet Jan. 16 to ratify options given by its directors on all its Mesabi lands. The company has several state leases and one other tract, one of the state leases being the e ½ of the s e ¼ of section 24, T 57 R 22. This has four holes in low grade ore and in taconite, and may contain some ore of value, though present explorations do not show it. The remaining properties are not so far along as that. The company has been at work for more than a year, and this is its net result, a result not especially discouraging, and no worse than many that could be cited, if as bad. As it is today, if one exploration out of ten turns out well the exploring company is to be congratulated.

With recent acquisitions of lands on the Gogebic range the United States Steel Corporation now has a practically unbroken line of lands along the formation there extending five miles, and ending with the Norrie properties at Ironwood. The Puritan, the latest of these acquisitions, is to be explored at once quite extensively and very thoroughly.

The Republic Iron & Steel Co. has acquired the capital stock of the Wills Mining Co., Mesabi range. The leases have not been transferred to the Republic company but the property will be operated under the charter of the mining company.

Puddlers Advanced to $6.12 1-2.

As a result of the bi-monthly examination of the bar iron sales sheets held at Youngstown, O., on Tuesday, Jan. 13, the puddlers will receive an advance of 12½ cents per ton during the months of January and February while the finishers will likewise receive an advance of 2 percent. According to the sales sheets the sales of bar iron during the months of November and December averaged up on a basis of 1.70c. The puddlers will now receive $6.12½ per ton as compared with $6 during the past four months.

More than 6,000 tons of wire were exported through the ports of New York, Philadelphia and Baltimore during December. South America, Australia and South Africa were among the principal purchasers, 2,000 tons having been shipped to South America. Six shipments, aggregating 1,057 tons, went to Australia, while 728 tons were shipped to South Africa. Continental Europe purchased 290 tons of which 261 tons went to British ports.

The Cleveland-Cliffs Iron Co., of Cleveland, has purchased a farm of 125 acres on the Maumee River and Duck Creek, Toledo, O. The company does not contemplate the erection of a steel plant or any other manufacturing plant in the near future, and may never do so, but, recognizing the fact that purchasable land fronting on the lake or on rivers emptying into the lake is very scarce, wise business policy suggested that such frontage be acquired for dock purposes and possibly for other uses. By this purchase the company comes into possession of one-half mile of river frontage.

The Central Connelsville Coke Co., of New Salem, Fayette Co., Pa., will erect 150 ovens. This plant now consists of 200 ovens and the entire 350 will be in operation about the middle of the year.

The Waddell Coal & Coke Co., of Philadelphia, with a capitalization of $1,500,000, will shortly be incorporated in New Jersey for the purpose of developing coal lands and erecting 300 bee-hive ovens in Barber County, W. Va. The company controls 22,000 acres of coal land in this county. S. H. Waddell, of Pittsburg, will be president of the company.

OVERHEAD TRACK SYSTEMS IN SHOPS AND FOUNDRIES.*

BY A. W. MOYER.

An important factor in the labor cost in establishments where there is much handling of the product in different stages of manufacture, is a system of overhead tramrail by means of which goods and materials in quantities, to move which ordinarily necessitated the employment of several laborers, may be quickly and easily conveyed to points anywhere along a shop floor, or from floor to floor by one man or even a boy. The cost of installing such a system is insignificant in comparison with the labor saving effected by its use. Plenty of instances are on record where the entire cost of a tramrail system quite extensive in character, has been saved in one year in labor economies alone; while the saving in time, the increase in manufacturing facilities, the simplification of the shop system, and the increased floor space, would place the shop far on the debtor's side of the installation account.

A typical plant for a room with high ceiling uses a track of flat rail, hung from girders by means of iron rods so braced that it is impossible for it to sway or sag. This track is 7 feet 2 inches in height, that is, from floor to the bottom of the track, but in cases where ceilings are low, or it is desired to have the track high enough to convey larger articles of manufacture, then the hanger feet alone are used without rods or braces. The hangers are made any length desired. The capacity of the track referred to is 2,000 pounds, and that amount of weight can be raised and conveyed to any part of the shop by one man. In another system I beams are used. This style of track is employed where the weight to be carried amounts to tons, the I beam having greater sustaining capacity than the flat rail.

I have stated that by means of tramrails the shop system may be materially simplified. One very striking instance of this as well as a direct saving in labor, outside of the mere conveying feature of a system, is fresh in the writer's mind. A large concern engaged in the manufacture of a line in which innumerable small iron parts entered, were running their factory on the piece-work plan. To determine the amount of each employe's day's work, a number of overseers were employed to collect count and tabulate the different pieces turned out at each bench. The cost of this supervision was a direct expense to the shop, and aggregated upward of $3,000 per year. With the introduction of a tramrail system, it was suggested that each man be provided with a tote box or receptacle for his work, and when his box was full that it be carried by rail to a point in the system where a tramrail scale had been installed, and there weighed, and the weight of the castings less the tare of the box, credited to the employes. A weight basis covering, say, 100 or 1,000 pieces, having been previously determined, the matter of getting an absolutely correct credit would be easy. The suggestion was acted upon and during the time the system has been used, one man has been able to do the work formerly requiring several, and there has been no friction in the shop due to differences in count.

In machine shops and foundries, tramrail systems are being used to eminent advantage. Even where there are plenty of crane facilities, it is obvious that crane service can not often be extended at one time to more than one part of the floor or machine. A tramrail system can be used by a hundred or more at a time, the use of switches and side tracks removing any trouble which might be due to temporary blockage of the system. The Moyer tramrail system is in use in many of the largest industrial plants in the country. J. W. Moyer & Co., of Philadelphia, the designers and builders, some 13 years ago started a business dealing entirely with overhead tramrail systems and during that time have laid out and installed systems in thousands of plants, many of which were extensive and elaborate. A short time ago, they designed and installed a system in the works of a large concern in Philadelphia making agricultural implements. The immense amount of small cast iron parts entering into these goods entailed a very large amount of handling in different departments, and as the tramrail system there installed is a good example of an all purpose shop system, photographs of the same were secured to illustrate this paper. [The speaker then had views thrown upon the screen, explaining them in detail. Some of this comment is included in the following.—Ed.]

The first view was of a flat rail system, the rail being made of 3x½-inch flat bar iron. The hangers of wrought iron were bolted to the rail, and suspended from the ceiling by rods ⅝-inch in diameter. The section of rail shown was 180 feet long, with a switch at right angle located about half way. In the main shop, material in the early stages is handled preparatory to going to the floors above. Large boxes are used for collecting the material, and these are hoisted from the floor by means of differential chain blocks suspended from the trolley. The trolley is the regular Moyer two-wheel trolley, running on anti-friction bearing wheels. A slight push or pull will propel the load in either direction. The small parts, consisting of castings or forgings, are received in the rear of this floor from a loading platform, and by means of the tramrail system are run near to storage bins and the boxes unloaded.

Another view showed material brought to drilling machines. One of the loads previously shown had been switched off. At the switch the straight section was seen thrown out of the way, and the curved section in place for the cut out. This style of switch is known as the "lift up switch." All three ends of the rails are closed at one time, preventing a load being pushed off the rails, an important feature when heavy loads are being carried.

The box load, after crossing the other rails, was shown in the grinding department, where it was unloaded to serve the different grinding machines. After grinding, the material passes along to a scale and thence to an elevator. The Moyer tramrail scale weighs all loads without their leaving the track. The "piece work check system" is employed in this establishment. The scale is tested to the Government standard and is supplied in various capacities ranging from 1,000 to 3,000 pounds. After weighing, the load is taken along the tramrail to an elevator and raised to a system on the floor above. The elevator has a section of rail on it and connects with the rail on all floors. One of the most interesting features of the system is the arrangement for switching parts required to be painted or enameled into the painting room and thence to the ovens. The switching devices are very simple, the lift up switches employed elsewhere in the system being used here also. After a car has entered the oven, the track opening in the oven front is closed by a hinged stop so that the oven is perfectly sealed. The loading of the carriers used for oven work is done at the spot where the parts are painted or dipped, and there is no rehandling until baking is completed and the carrier arrives at the assembling benches. One load shown weighed 1,860 pounds, indicating something of the number of pieces carried. The cars are made entirely of bar iron and serve also as draining racks for dipped goods.

A view of the assembling room showed a main line running completely around the room, which is 200 feet long and 80 feet wide, with a center and cross tracks. Carriers loaded with finished parts are brought here direct from the various departments and unloaded at the different points where the finished article matures. The different sections of the department are well covered by the tracks, leaving very little handling to be done after the load is dropped. In the machine shops, an auxiliary system of tracking has been introduced for handling the work on the lathes, drills and benches.

As an example of installations made in foundries which in their layout and construction are different from the foundries built and equipped in recent years, views were

*From a paper read before the Foundrymen's Association at Philadelphia, Wednesday evening, Jan. 7, 1903.

given of the foundry of a New York concern manufacturing bath tubs, hoppers, plumbers' supplies and stable fittings. Some difficulties were encountered owing to the irregular construction of the building. An I beam system is used. The trolleys have wheels on both sides of the track, so that it is impossible for them to lose their base. The foundry comprises practically four large molding shops, one cupola supplying all four. The shops are quite large and before the tramrail was put in, considerable trouble was experienced due to the cooling of the iron. A 30-ton cupola supplies all floors, and the average heat is about 23 tons per day. The cupola is located between two of the shops and is not in the most convenient location for pouring, and were it not for the introduction of a tramrail system, it would be necessary to have extra cupolas to supply the demand made by an ever-increasing business. The situation of the cupola is such that in carrying small quantities of molten metal the distance necessary to work there would ordinarily be trouble from cold metal. The system of pouring in this case is simply to fill large ladles with one or two tons of metal, run them to a point in the foundry where they can be gotten at with as little trouble as possible and then pour to smaller or hand ladles, repeating this operation as many times as necessary. A view of the larger shop showed the tramrail entering the shop, turning and running the whole length of the building, serving the floors on each side. The ladles are carried by triplex hoists and handled by two men. Owing to the extreme width of the building and the consequent danger of overstraining the roof girders, posts have been placed at intervals to carry any strain due to the tramrail system. Liberal use is made of the system in this building for conveying the heavier castings. In another view was shown the switching arrangement where two lines of tramrail cross each other at right angles, and where ordinarily a turntable is used. In the Moyer system turntables are never used on account of their high cost, the great amount of head room required, and the liability of getting out of order. Instead, two and three way switches are used, with the result that a load is more quickly handled, and the possibility of a load being pushed from the rail is entirely done away with.

Some figures were given in the paper illustrating the economy of the trolley system. In the case of the concern making small parts, views of whose shops were shown first, it was stated that the tramrail erected complete cost $2,000. The counting system in vogue before cost $2,340 a year. All this expense is saved. There is also a great saving in the painting and enameling department. Formerly three times as many men to enamel and hang the parts in the ovens were required, and only one baking could be done daily. Now two bakings a day are possible and there is finished double the amount of pieces with but half the labor. The speaker stated that the total saving at this plant is more than $4,680 a year on an investment of $2,000.

Another set of views shown were of a new foundry in Bridgeport, Conn., making pipe fittings. The foundry is 330 feet long by 150 feet wide and has two cupolas separated at equal distances from each other and from the ends of the foundry. By a test it was seen that two men were able, without undue exertion, to carry a full ladle, or "growler," filled with 1,500 pounds of molten metal from either of the cupolas to either end of the foundry in one minute. It would take two men double or triple that time to carry a ladle holding but 150 to 200 pounds of metal. In other words, two men were carrying in one minute a load which if divided up into 150-pound ladle loads, would have taken 20 men twice the time to carry by hand. Laborers in the foundry are paid $1.50 per day and it is this class of laborers who run the ladles along the track. Only twelve laborers are employed at a daily wage of $18, or $5,400 per year. If only three times the amount of labor were required if the tramrail system were not used, the wage would be $16,200; and by subtracting $5,400 from that sum, we find that if the 12 laborers worked all day at carrying the ladles, there would have been a saving of $10,800. But as by means of these 12 men and two cupolas, 52 tons are poured in two hours, and as the day is an 8-hour day, the actual yearly saving in this item alone is $2,100. The system cost the firm $3,000 and the president informed the writer that they had actually saved the first cost in half a year's run.

The foundry floor is nearly clear, only having a double row of posts. A double skylight runs the length of the building, operated by one wheel and chain from one end. It was found, however, that better ventilation could be obtained by cutting this operating device up into four, consequently each row 330 feet long was divided into four sections. The two cupolas each pour in two hours and forty minutes, thirty-seven tons of metal, or 74 tons for the two. Hydraulic elevators, working on the outside of the building, raise the pig iron, coke and scrap 20 feet to a platform. Instead of the large doors at either end of the foundry sliding sidewise, thereby cutting off light, they raise and lower, as easily as an ordinary window sash. On each side of the foundry, from wall to wall, the tramrail extends. Across the center in front of both cupolas are branch lines and again another line runs the long way down the center, switching in turn into the cupola tracks. This leaves a square space in front of and between the cupolas clear of tramrail, and in this space stationary cranes operate. From the floor to the roof was 36 feet and the "Y" hangers were 20 feet long, making the track 16 feet from the ground. These "Y" hangers were made of bar iron, twisted and well braced. At the I beam, they fasten with a clamp on top and are clamped to the roof truss as well. There is little or no side sway or vibration while the load passes along the system.

A view was shown of the cut-out tracks, with their switches. One "growler" never waits on another in this arrangement, for after a few weeks' use the workmen get to understand the easiest way to operate the system was the right way, and in the words of the old foreman of the foundry, "the boys never made so much money and worked so little, lugging iron, in their lives."

At the cupola the ladle suspended from the tramway receives the molten metal. Simple hinged pieces, fastened to the brickwork, hold the ladle firmly in place while being filled, preventing the possibility of spilling, and they are easily folded back against the wall when not in use. A switch was shown thrown for the curved rail connection, with an empty ladle waiting to be run under the spout to be filled.

In the concluding portion of his address the speaker made some comment on the comparative efficiency of the trolley system and an industrial railway built on the foundry floor.

A meeting of the stockholders of the Standard Chain Co., of Pittsburg, will be held on Tuseday, Feb. 17, for the purpose of voting on the proposition of reducing the stock from $3,000,000 to $1,500,000. It is reported that 90 percent of the stockholders have already sanctioned the reduction and there is little doubt but that the proposition will pass without a dissenting vote.

The Braddock Machine & Manufacturing Co., of Braddock, Pa., will increase its capital from $200,000 to $400,000 to provide funds for additional improvements that are to be made to the plant.

Regarding American Steel Foundries, Dow, Jones & Co., New York, have published the following: "The current earnings of the American Steel Foundries Co. amount to about 6 percent per annum on the common stock after allowing for the dividend on the preferred stock. Economies are now being introduced in the operating departments, which in the course of time are expected to show favorable results. Business on the company's books is sufficient to keep its plants busy for several months to come."

THE BRITISH WESTINGHOUSE ENTERPRISE.

The directors of the British Westinghouse Electric & Mfg. Co., Ltd., of London, Eng., have recently issued their third annual report, showing a material increase in the company's business and indicating an industrial re-awakening in England. Heretofore orders have been executed at Pittsburg, but now that the company's works at Trafford Park, Manchester, Eng., are practically completed and about 3,000 men employed, manufacturing operations have begun and all orders will be executed there. A construction department has been organized to carry out building and general construction work, enabling the company to undertake the complete installation of large railway, power, and lighting plants. This department will be under the management of Mr. James C. Stewart, of the well-known engineering firm of James C. Stewart & Co., whose record bricklaying performance in connection with the Manchester works caused so much comment.

Important contracts have been obtained by the British Westinghouse Co. during the past year, including those with the Metropolitan District Railway Co., the Metropolitan Railway Co., the Clyde Valley Electrical Power Co., the London United Tramways Co., Ltd., the Bath Tramways Co., Ltd., Exeter Corporation, Newcastle Corporation, and the Swansea Corporation.

The erection and equipment of the works at Trafford Park have absorbed the bulk of the available capital of the company, comprising approximately $8,750,000, of which $5,000,000 is in 6 percent preference shares and $3,750,000 in ordinary shares. The extensive business in hand, as well as the new business in prospect, all of which is to be executed at the company's works, will require additional funds for material, labor and working capital. The directors propose to create an additional $200,000 6 percent preference shares of approximately $25 each, one-half of which is to be issued immediately.

OBITUARY.

Andrew McWilliams, aged 60 years, and superintendent of the carpentry department of the Edgar Thomson works of the Carnegie Steel Co., was struck and killed by a shifting engine in the yards of the works on Friday morning, Jan. 9. Deceased a short time ago received an allotment of stock amounting to $25,000, when the distribution was made to the 23 employes for the longest terms of service with the company.

David L. Evans, one of the best known foundrymen in the Pittsburg district, died at his home in Allegheny, Pa., on Wednesday evening, Jan. 7, after a short illness. Mr. Evans was born in Wales in 1833, and while quite young his parents came to this country and located at Brady's Bend, Pa. He was apprenticed in the foundry business and in 1854 he went to Pittsburg and found employment at his trade. Forty years ago he held a position as foreman of the Anderson foundry at Pittsburg and for many years he was superintendent of the Rosedale foundry at Allegheny, Pa. Some years ago he became connected with the Pennsylvania Casting & Machine Co., of Allegheny, and was superintendent of the foundry until his death. He was also one of the oldest members of the Pittsburg Foundrymen's Association and attended its meetings with great regularity.

Gen. Samuel Thomas died Jan. 11, at his home in New York, aged 62 years. When a very young man, he was employed as a clerk by the Keystone Iron Co., at Marietta, O. He served with distinction in the Union army for four years of the civil war and after the war lived for many years in Columbus, O., and was president of the Columbus Rolling Mill Co. for several years. He was one of the organizers of the Columbus & Hocking Coal & Iron Co., and was for some years president of that company. In recent years, Gen. Thomas lived in New York and was interested largely in railroad and other corporations.

PERSONAL.

J. E. Moyer, who has been superintendent of Corrigan, McKinney & Co.'s blast furnace interests for some years at Cleveland, and at Scottdale and Charlotte, Pa., has resigned his position. Mr. Moyer will take a much needed vacation for a few weeks before establishing any new connection.

David Young, mine foreman of the Nellie coke plant of Brown & Cochran, near Dawson, Pa., has resigned his position to accept the superintendency of the Revere plant of the W. J. Rainey Coke Co.

A number of operating officials of the American Tin Plate Co. inspected the plants at Monessen, Pa., and Martin's Ferry, O., and Chester, W. Va., last week. The party consisted of William Richards, general superintendent of the Demmler plant, McKeesport, Pa.; Superintendent Stevenson, of the LaBelle plant, Wheeling, W. Va.; George Greer, district manager, New Castle, Pa.; District Superintendent Thomas Hill, of Elwood, Ind.; Assistant Superintendent G. B. Ross, of New Castle, Pa.; Assistant Chief Engineer G. Morse, of Pittsburg; W. P. Beaver, of New York, and Assistant Manager John R. Phillips, of Pittsburg.

P. McManus has resigned as superintendent of the plants of the American Steel Casting Co., with headquarters at Sharon, Pa.

Henry Phipps, of Pittsburg, has contributed $300,000 for the establishment of an institution at Philadelphia, Pa., for the treatment and study of consumption.

Charles R. Darrow has been elected president and general manager of the Mahoning Foundry & Machine Co. of Youngstown, O., to succeed Frank D. Runser, who resigned recently and withdrew from the company.

C. A. Reading has succeeded John E. Cox, resigned, as superintendent of the Indianapolis branch of the American Car & Foundry Co.

The Steel Corporation's Stock Plan.

According to a statement made by one of the officials of the United States Steel Corporation, 12,000 employes have availed themselves of the corporation's offer to take stock and by the end of last week 26,400 shares had been subscribed for, although only 25,000 shares are to be distributed. The Amalgamated Association has sent out the followng no.ice to its members relating to the profit-sharing plan of the corporation:

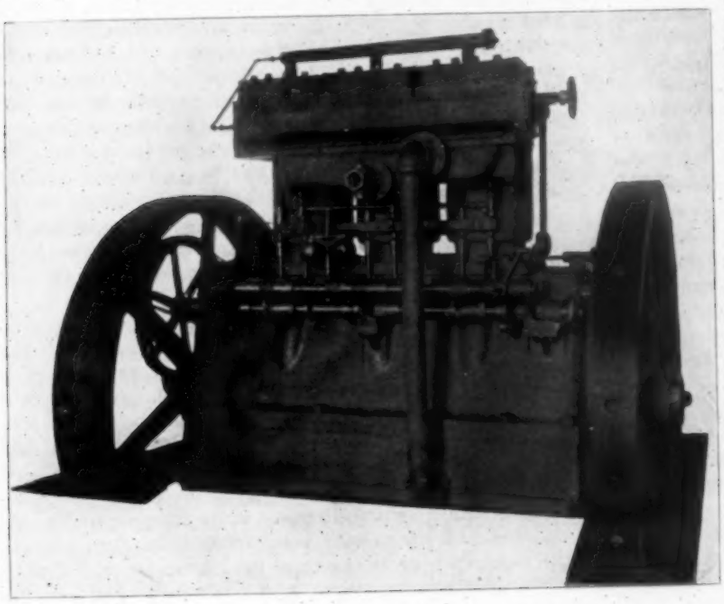
"The proposition of the United States Steel Corporation of placing $2,000,000 of its preferred stock aside for sale among its employes for a stipulated price and under prescribed conditions, has caused quite a stir. There have been inquiries as to whether there is anything in the laws of the association that would stultify the unionism of any of the members if they were to buy some of this stock. To such we say there is not. A member can be a stockholder in the works in which he is employed and hold full membership in the association. The question whether it is avisable for the members of the association to invest in these stocks is one that each member must decide for himself. It is not for the association to advise its members how they shall dispose of their money."

Concerning the published statement that the United States Steel Corporation has obtained options on 2,000 acres of coal land between Shilburn and Farmersburg, Ind., we are advised by Judge D. W. Henry, of Terre Haute, Ind., who was credited with making the negotiations, that he has options on the land, but not for the Steel Corporation. He still holds the options, but expects to dispose of them.

The Richards Mfg. Co., Aurora, Ill., recently incorporated, will not build at present, but may do so next fall. The company will sell the product of another concern.

THE NASH GAS ENGINE.

Perhaps no one factor has had a more wholesome influence in evolving the modern high-grade gas engine than the effort to adapt the machine to the requirements of electric lighting, and more particularly to plants of the direct-connected type. Here the conditions are much more exacting than for pumping or for ordinary power purposes. Close regulation in speed is a prime requisite; but reliability, durability, high economy and ability to generate continually the full rated power for long periods, when necessary, are all of great importance. In the practical application of gas engines to service of so severe a character, nothing has ever shown up more conclusively their weak points, where such existed, than electric lighting. An engine built for service of this kind, and containing some special features is the Nash engine, manufactured by the National Meter Co., New York and Chicago. As shown by an illustration of the 125-h. p. engine, it is of the vertical, enclosed, self-oiling type. Engines of 3 to 10 horsepower are of the single-cylinder form, those of 15 to 30 horsepower of the two-cylinder, and those of 40 to 125 horsepower and upward, of the three-cylinder form. It will be noted there is a unity of design throughout the range of sizes, although differing in the details



THE NASH GAS ENGINE.

of construction. There are many manifest advantages in the vertical type of frame that are now more and more recognized by engineers, particularly for electric lighting plants, such as greater compactness, increased strength and stiffness of the machine for a given weight, due to transmitting the working stresses directly to the foundation where they are absorbed with the least possible strain upon the frame itself, also, eliminating the weight of pistons, as an element in the wear of the cylinder. Besides these, protection of the main working parts against dust; and self-oiling features for same, combined with quick access to the interior of the crankcase, when desired, are accomplished in the Nash vertical type of engine. The cylinders are all separate castings, independent of each other, and are mounted on top of frame with the valves and valve mechanism of simple and convenient arrangment.

The valves are all of the plain poppet type and are actuated by hardened cams through the medium of hardened rollers carried by levers on a separate shaft. The by a similar cam from the same shaft, while the exhaust connection with its flanged opening is at the upper end of cylinder. The gas and air connection with flanged opening, is placed immediately below the exhaust cam shaft is driven by a pair of spur gears. The gas valve, controlled by the governor, is operated by a lifting toe carried on the stem of the main admission valve; this toe either engages or releases a latch or pawl on the gas-valve stem so as to admit or exclude gas, according to the load upon the engine. The exhaust valve is located immediately back of the admission valve, being operated nection, and the gas enters the mixing chamber through a central opening, surrounding which is an annular one that admits the air. In consequence of this arrangement a thorough mixture of the gas and air takes place. All the valves and the whole valve motion, including the governor and starting device, are brought conveniently together on the working side of the machine, in the case of two and three-cylinder engines. It is for the most part external to the engine and convenient for oiling, examination and adjustment.

Electric igniters of the make-and-break type are operated by excentrics carried on a side shaft along the front of engine, motion being conveyed from the cam shaft on opposite sides by means of a cross shaft at the end, and two pairs of gears. Tube ignition has also been used. The igniters for each cylinder are independent of each other, and each has means of adjustment to time the point of ignition, as desired, without stopping the engine. The poppet valves are made of drop forged steel with long stems, carefully fitted to bearings and guided at top and bottom, thus securing an accurate seating without any side springing to occasion wear and leakage. Inserted valve casings are not used in the Nash engine since the maker's experience has shown them to become so distorted by heat as to leak or break. Moreover, it complicates the design and renders efficient cooling of the valve cases and valves more difficult.

The cylinders are water-jacketed on sides, heads and valve cases. Special attention is given to have the cooling water enter and leave the cylinders at the most effective points to prevent undue heating of any part. Trunk pistons, over two diameters long, are made of proportionately great length to diameter, the better to resist any wear due to their function as cross-heads. The crank is in one piece of forged, open-hearth steel. The shaft runs in adjustable bronze boxes of the proper number to provide each crank with a bearing on each side.

Engines of the single-cylinder pattern have a simple form of shaft governor, while those of two and three-cylinder pattern are provided with a special form of fly-ball governor, driven at moderate speed by bevel gearing from the cam shaft. Both these forms regulate by the method of missed ignitions and secure steady speed, the variation in engines specially adjusted for electric lighting not exceeding 2 percent from no load to full load. The fly-ball governor is particularly sensitive. It does not operate the gas valves directly, but indicates, by the position of a lever to which it is connected, whether or not the lifting pawls carried by the valve stems shall act upon the gas valves or keep them closed, as demanded by the load upon the engine.

The 50-horsepower direct-connected engine has three cylinders, speed being 270 r. p. m. The 125-horsepower engine has three cylinders, speed 225 r. p. m. These speeds are all quite moderate, although the vertical type of engine safely permits considerably higher ones. But the manufacturers consider that much more satisfactory results in the way of thorough lubrication, proper cooling of the cylinders, economy and general good working qualities are obtained when operating at moderate speeds, even though it calls for more liberal cylinder and other proportions.

On account of the difficulty of starting the large engines by hand, three-cylinder engines of 40 horsepower and larger are provided with the Nash compressed air self-starting device. This consists of an air compressor and suitable valve mechanism to operate one of the cylin-

ders by compressed air. A single movement of the starting lever relieves the compression in two of the gas cylinders and also disconnects the admission valve on the remaining cylinder which is to be operated, temporarily by air. At the same time supplementary cams are thrown into action to open the exhaust valve and also a special air valve in this cylinder, once every revolution. Thus the right-hand cylinder operates as a single-acting compressed-air engine, while the others are placed in position ready to start up with gas.

As soon as speed is attained and ignitions occur in the other two cylinders, the starting lever is moved back to its normal position, the air-starting mechanism is disconnected and the machine operates as a gas engine.

These engines are the invention and design of Lewis H. Nash, M. E., to whom have been issued nearly 300 United States patents.

Receiver for United States Tube Co.

A receiver was appointed Jan. 9 for the United States Tube Co., Buffalo. The company found that it was unable to float $100,000 worth of bonds. The Buffalo Loan, Trust & Safe Deposit Co. is temporary receiver. The company is capitalized at $1,000,000. Its assets are $213,341.75; liabilities, $70,725.33. The largest creditors of the firm are the Buffalo Loan, Trust & Safe Deposit Co., which advanced $35,000 and is holding $50,000 of first mortgage bonds as security and the Columbia National Bank, which has loaned $20,000, secured by assigned accounts of sufficient value to protect the indebtedness. It is thought that the company will be able to resume business. Harvey H. Flagler, of Boston, is president, and Chas. H. Twist secretary and treasurer. The company was incorporated under the laws of West Virginia and in January, 1901, purchased a site of ten acres at Buffalo, on which the plant, having a capacity of about 60 tons of steel tubes, was built. The capital interested came principally from New York and Boston.

Colorado Fuel & Iron Co.'s Output.

The following is a comparative statement of the output of the Colorado Fuel & Iron Co.'s plants for three years, with the last two months of 1902 estimated:

	1900 Pounds.	1901 Pounds.	1902 Pounds.
Pig iron	265,475,854	331,027,390*	481,804,934
Spiegel	8,388,600	19,061,080	17,522,599
Steel rails	240,700,457	309,798,872	312,406,486
Steel plate	3,412,051	**	**
Merchant iron and steel	65,668,819	95,767,889	129,442,317
Castings	22,262,144	24,710,787	27,547,711
Iron pipe	16,070,133	13,527,615	19,477,687
Spikes, bolts and nuts	18,344,266	24,607,616	25,222,235
Iron ore	539,715,810	691,702,030	1,029,124,800
Totals	1,180,038,134	1,510,203,288	2,042,548,869

*"A" Furnace was blown in Sept. 4, 1901, and until that time the deficiency of pig iron was shipped in from the East.
**Old plate mill dismantled to make room for improvements. New mill not in operation.

The average number of employes was as follows: 1900, 8,688; 1901, 11,569; 1902, 15,087. The average amount of monthly pay rolls was: 1900, $436,585; 1901, $579,082; 1902, $731,700. The coal and coke product was: 1900, 8,135,569,900 pounds; 1901, 8,652,985,700 pounds; 1902, 11,357,681,400 pounds.

The Caldwell-Wilcox Co., Newburg, N. Y., has granted a nine-hour day to all employes. Only the molders had asked for it. The following shops of Portland, Ore., have granted their men a nine-hour day: Willamette Iron & Steel Works, Pacific Iron Works, Portland Iron Works, Columbia Engineering Works, Phoenix Iron Works, Smith & Watson Iron Works.

The strike of the machinists and boilermakers at the Superior Shipbuilding Co.'s yards at Duluth, which had been on about a month, has been settled, the men being given an advance of 8 percent in wages and the controversy as to lunch hour having been adjusted.

THE MOOSE MOUNTAIN ORE DEPOSITS.

The iron ore deposits discovered by Chase S. Osborn, railroad commissioner of Michigan, and others, of which brief mention was made in these columns last week, are located north of Sudbury, Nipissing district, Ontario. In financing the two companies formed to continue explorations and to operate the mines, Mr. Osborn has associated with him John W. Gates, Chicago; John J. Mitchell, president of the Illinois Trust & Savings Bank, of Chicago; John Lambert, of Chicago; Charles G. Gates, son of John W. Gates; C. Hutchins, attorney for Illinois Trust & Savings Bank; Blair & Co., New York bankers; Capt. Joseph Sellwood, of Duluth; and John C. Spry, a lumberman of Chicago.

The deposits are located in what is known as the Moose Mountains and extend over 30 or 40 miles. The principal discoveries have been made in that portion of the range along the west branch of the Vermillion River, prolonging northwest and southeast into the township of Hutton in the Nipissing district. Out of this township to the northwest the range runs into an unsurveyed territory of the Algoma district. The companies, whose organization was announced in *The Iron Trade Review*, control five miles of land along the formation and cover the largest discoveries made up to the present time. The ore is a hard magnetite from 60 to 67 percent metallic iron, with much that is so low in phosphorus as to be Bessemer in grade. It is said to be without a trace of titanium and is low in sulphur. The ore outcrops in many places and these outcrops are large and of such clean ore that at least five of them will be shipping mines as soon as transportation is furnished. The properties are located 18 miles distant from the north shore, main line of the Canadian Pacific, but are reached now by a wagon road from a station 45 miles away. The haul to water is 70 miles. The ore will reach water at or near Killarney, in Georgian Bay.

Prof. Kenneth Leith, of the United States Geological Survey, estimates that there is in sight at present on the properties of the companies with but little exploration or development, 10,000,000 tons of 60 percent ore, providing the ore prolongs to a depth of 250 feet. Of ore of the lower grade but yet valuable, Prof. Leith estimates that there are 140,000,000 tons in sight at a depth of 250 feet. Walter Fitch, general manager of the Champion mine, closes a report on the property made after a personal inspection with the opinion that surface indications warrant the belief that the discovery of the Moose Mountain range is the greatest ever made in the history of the iron development of this country, except the Mesabi range. Capt. Joseph Sellwood, a member of the new companies, says the surface showings are larger and stronger than he has ever seen.

The work done up to the present time has consisted of locating and securing titles to the properties, road building, camp building, diamond drilling, trenching, crosscutting and test pitting. In this work there has been expended over $100,000. It is expected a railroad will be built into the property next summer.

Chas. G. Gates, a son of John W. Gates, when asked about the new discoveries, said: "It is a big surprise to me to learn that the matter has become public. It is true that I am interested. The ore deposit is an immense one. It was discovered a year ago, and we are going to develop it."

The Eastern Steel Co., Pottsville, Pa., has begun work on four open-hearth steel furnaces, which will have a capacity of 150,000 tons a year. Steel will be made by July 1.

The Forsythe Pattern Co., of Youngstown, O., has been awarded the contract for the patterns for the bed plates for the reversing engines which the William Tod Co., of the same place, is building for the Lackawanna Steel Co., of Buffalo.

ANNEALING OF STEEL DRILLINGS PREVIOUS TO SULPHUR DETERMINATIONS.

BY B. F. WESTON.

It seems to be generally conceded that the evolution method for the determination of sulphur in pig and cast iron give results which are about .005 to .025 percent too low. This discrepancy is supposed to be largely due to the formation of some sulphur compound (thought to be of the Mercaptan series) which is not caught by the usual absorbents, or at least does not react with the iodin solution used in subsequent titration.

In the *Iron Age* for May 8, 1902, there appeared an article by Geo. T. Dougherty, of Chicago, on the "Complete Evolution Method for Sulphur in Iron," in which the author advocated placing the drillings in a porcelain crucible, and cover with one-half of a 9-ctm. filter and ignition for 15 minutes. The object of the filter was to prevent, as far as possible, the oxidation of the drillings. It is understood that he applied this method to pig and cast iron only. From the simplicity of the operation, and results given, the writer was led to try the effect of thus annealing the drillings from the test pieces of basic open-hearth stock, ranging from about .02 to .03 in sulphur and of medium carbon. These test pieces are taken in a sectional cast iron mold about ½-inch thick, and when removed from the mold are about 5 inches long by 1¼ inches square. When sent to the laboratory, the test piece is about 2 inches by 1½ inches square. After drilling 5 grams are weighed and placed in a No. 8 Meissen crucible, covered with ½ of a 9-ctm. filter, lastly with the porcelain cover, and ignited for 15 minutes over a blast lamp, and allowed to cool. After this treatment, the drillings will be found slightly blued and somewhat caked together, but are easily poured into the evolution flask, and treated with 75 cc of a mixture of equal volumes of strong hydrochloric acid and water; the evolved gases are passed through a short return condenser and absorbed in cadmium chloride solution. After the solution is complete and the dilute hydrochloric acid solution in the evolution flask has boiled about one minute, air, purified by passing through potassium permanganate, is aspirated for about ten minutes. The cadmium sulfid is dissolved in dilute hydrochloric acid, the solution diluted and titrated with iodin solution of which 1 cc equals .005 percent on 5 grams of sample. The usual method was also run at the same time on the unignited drillings by the same person, thus eliminating so-called "personal equation" as far as possible. The following results were obtained:

	Unannealed. Percent.	Annealed. Percent.	Difference. Percent Plus.
Sample No. A	.026	.03	.004
" B	.0235	.0255	.002
" C	.0295	.034	.0045
" D	.024	.025	.001
" E	.024	.027	.003
" F	.022	.0275	.0045
" G	.0215	.0245	.003
" H	.0195	.022	.0025
" I	.0255	.03	.0045
" J	.02	.0205	.0005
" K	.024	.026	.002
" L	.0255	.0295	.004

Average gain of annealed over unannealed samples, of .003 percent sulphur.

The decimals were carried out to the fourth place, not to imply accuracy to that point, but simply to give the results found on titration. At the present time, the writer is inclined to the theory of the formation of an organic sulphur compound, formed by the action of the acid on certain forms of carbon in the more or less hardened steel, and which are more or less caught (perhaps mechanically) by the absorbent used, but do not react with the iodin solution. It was noticed that the precipitated cadmium sulfid was of a clearer yellow in the annealed samples, while that from the unannealed samples was lighter in color. It is the hope of the writer some time to investigate further as to the cause of the difference in results. At the present time we are annealing our drillings for sulphur determinations in an iron tube by placing the drillings in a small porcelain boat, inserting into the iron tube, passing a current of natural gas, to drive out the air, then heating the tube to bright redness for 15 minutes, at the same time continuing the slow passage of gas. The heat is finally turned off, and the drillings are left to cool in the current of gas until they are below the point at which they will oxidize in the air. When they are removed and the determination proceeded with. Drillings treated in this way remain nearly as bright as before, or at least are only very slightly blued in the boat in the end of the iron tube at which the gas enters, while drillings ignited in the crucible are oxidized much more, which is shown by the presence of a slight trace of ferric chloride when treating them with the dilute acid.

Laboratory Page Woven Wire Fence Co.,
Monessen, Pa.

Changes in Pittsburg Steamship Co. Vessels.

The Pittsburg Steamship Co. will spend several hundred thousand dollars this winter in so changing the vessels of its fleet as to permit rapid loading and unloading to proceed under most favorable conditions. Nearly all the boats have hatches which are not wide or long enough to enable the clamshells to work to best advantage. The hatches will be made larger and such beams and stringers between decks as can be dispensed with without injuring the stability of the boats will be removed. Other changes to be made in the fleet will be to reduce the power of vessels so that the amount of coal consumed will be cut down at least one-third. The policy of the company will be to dispense with barges whenever possible, providing every vessel with its own power. These changes will involve a large expenditure, but the company is confident that they will result in positive economies.

This is the season of calendars, and in addition to those already enumerated, we acknowledge a beautifully illuminated series of cards, one for each month of 1903, each bearing a biography and colored picture of some leader in the world of science—these sent out in a neat case by the Bullock Electric Mfg. Co., of Cincinnati; a series of elaborate panel calendars from Theodore Hofeller & Co., of Buffalo; also calendars from the Berger Mfg. Co., of Canton, O.; the Philip Carey Mfg. Co., of Lockland, O.; the Shill Brothers Co., of Crestline, O.; and the Marion Steam Shovel Co., of Marion, O.

The Boozer-Gotshall Machinery Co., Waterloo, Ind., is considering the advisability of increasing its capital and continuing in business in that city or of moving the plant from Waterloo to another city which has offered inducements.

The business of Isaac G. Johnson & Co., steel and malleable iron founders, carried on for many years at Spuyten Duyvil, New York City, by Elias M. Johnson, Isaac B. Johnson, Gilbert H. Johnson, Arthur G. Johnson and James W. Johnson as partners, has been incorporated under the name of Isaac G. Johnson & Co., with a capital of $1,000,000, to manufacture iron, steel, copper, bronze and gun metal. The respective interests of the above parties in the corporation will be the same as their interests in the firm. The new company has purchased outright the extensive plant and improvements formerly leased from the estate of Isaac G. Johnson and sufficient additional capital has been put into the business for this purpose. There will be no change whatever in the management of the business. The directors consist of the five persons above named and the officers are as follows: President, Elias M. Johnson; vice president, Isaac B. Johnson, treasurer, Gilbert H. Johnson; secretary, James W. Johnson; general manager, Arthur G. Johnson.

The new plant of the Battle Creek Iron Works Co., Battle Creek, Mich., was put in operation last week. Twenty men are employed.

NO NEW LABOR UNION AT SOUTH CHICAGO.

Officials of the Illinois Steel Co. deny the report that a new labor organization has been formed by its employes at the South Chicago Works in opposition to the Amalgamated Association of Iron, Steel and Tin Workers, as was reported by the daily press of Chicago. The Amalgamated Association revoked the charters of the lodges at South Chicago, Joliet and Milwaukee in 1901, because of the refusal of the men to participate in the strike of that summer. The members of the Lakeside lodge at South Chicago, wishing to keep their organization intact, shortly afterwards formed a local body under the name of National Steel Workers of America, and the lodges at Joliet and Milwaukee followed suit. The organization has no membership outside the employes of the Illinois Steel Co., nor is it seeking to extend its influence. Neither has the company recognized it as other than a social organization, dealing with its men as individuals. The meeting of the members of the South Chicago branch last Sunday night was the annual smoker and banquet, to which were invited several business men of South Chicago, and representatives from the mills at Milwaukee and Joliet. One of the speakers of the evening commended the action of the United States Steel Corporation in offering stock to its employes, and this was the only reference made during the evening to the relations of the men with the company.

The Waddell Coal & Coke Co. will be incorporated under the laws of New Jersey. S. H. Waddell, Pittsburg, formerly secretary and treasurer of the Union Steel Co., and later assistant to the president of the H. C. Frick Co., will be president of the new corporation. Theophilus Sproull, president of the Equitable Trust Co., of Pittsburg, will be treasurer. The company has purchased 22,000 acres of coal land in Barbour county, West Virginia, and will soon begin the opening and operating of mines and the building of coke ovens.

The Columbus Screw & Machine Co., Columbus, O., has been incorporated with a capital of $15,000. The company is composed of wageearners. Officers have been elected as follows: President, T. J. Ferrell; vice president, O. V. Kuhn; secretary-treasurer, J. B. Foster. The stock is issued in shares of $1 each, but no one man will be allowed to control the majority of the stock.

The Berlin Machine Works, Beloit, Wis., manufacturers of special wood working machinery, have been building continually for the past year. Various additions cover a ground area of over 75,000 square feet, thus giving several more acres of floor space. These buildings are all of steel and brick construction and are, therefore, practically fire proof. A hot water heating plant has been installed for heating all of these new buildings. Tracks and turn tables are freely scattered throughout the additions. Four new electric cranes have been installed; one of them 15 tons capacity. Motive power has been changed and all tools throughout the new plant are electrically driven. A large number of machines have been added, including, planer, lathes, milling machines, shapers, grinders, etc. The total expenditures for the last year in buildings and equipment will reach $250,000.

Production of pig iron at the Ohio plant of the National Steel Co., at Youngstown, O., show a total of 525,982 in 1902, stack No. 1 producing 190,921 tons; No. 2, 188,514 tons, and No. 3, 146,547. No. 3 furnace was idle for ten weeks for relining. The outputs of Nos. 1 and 2 in 1901 were 178,578 tons and 177,395 tons respectfully. In the converting department the production in 1902, was 685,609 tons of ingots. The best previous production was in 1901 when the output was 562,572 tons. The finished tonnage of the plant was 575,131. Of this 314,576 tons were rails, the remainder being billets and bars. The best previous records in finished lines were made in 1899 when the production was 459,700 tons and in 1901, when it was 459,616 tons.

The thirty-five acres recently purchased at Lebanon Pa., by the Lackawanna Iron & Steel Co. were acquired on account of the underlying limestone, which will be used for furnace purposes.

At its Sylvan Works at Moline, Ill., the Republic Iron & Steel Co. is putting in a new 8-inch finishing mill with four sets of 10-inch roughing rolls, also a Morgan continuous heating furnace for heating 30-foot billets. The mill is to be driven by a Buckeye tandem compound condensing engine with a 24-inch high pressure cylinder and a 44-inch low pressure; having a stroke of 42 inches.

The Duplex Mfg. Co., manufacturers of steel drainage supplies, will build a foundry, 70x140 feet, at Elyria, O., and is in the market for a complete foundry equipment. The office at present is in the New England building, Cleveland.

The N. & G. Taylor Co., Philadelphia, manfacturer of tin plate, has been and still is exceedingly busy at its works at Cumberland, Md., and Philadelphia. A short stop to allow making annual repairs was made, but all departments will be in operation next Monday. The works in Philadelphia have been and are running uninterruptedly and have a large amount of business to take care of.

We are in receipt of the very artistic menu card of a banquet given the management of the Colorado Fuel & Iron Co., at the club house at Pueblo, on Dec. 30, 1902, by the superintendents of the Minnequa plant. The front cover bears a half-tone reproduction of one of the modern blast furnaces completed at this plant last year. On the inner pages of the card is reproduced a broadside view of the new mills and furnaces under way at Pueblo. The honorary guests were J. C. Osgood, J. A. Kebler, A. C. Cass, D. C. Beaman, J. L. Jerome, J. M. Herbert, Frank Trumbull, C. S. Robinson, J. T. Kebler and J. F. Welborn. Nearly all were present and made responses to formal and informal toasts.

The Robinson Clay Product Co., of Akron, O., announces that it has acquired the Robinson-Merrill Pottery Co., the Robinson Bros. & Co., the Crown Fire Clay Co., the Royal Sewer Pipe & Fire Brick Co., the Lock Haven Sewer Pipe Co. and the Canton & Malvern Fire Brick Paving Co. The management will remain unchanged, but it is expected that methods of manufacture and plans for the distribution of the product will be improved.

The Great Northern Construction Co., Chicago, has sold its plant in Proviso township, near Chicago, and a plot 330x400 feet in the city, formerly occupied by the Scully Iron Works, to the Edward A. Bryan Co., the reported consideration being $75,000.

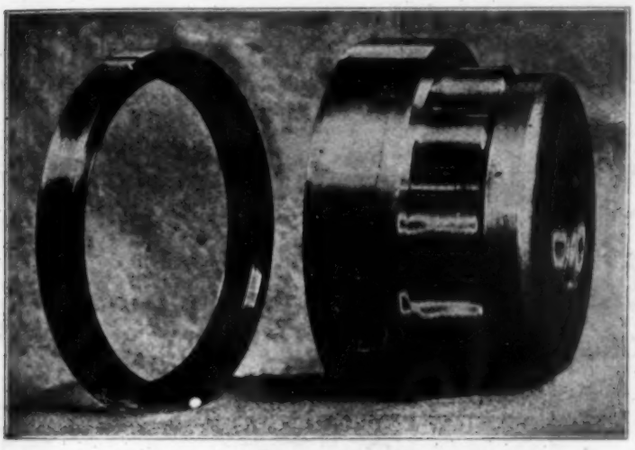
The Archibold Wheel Co., Lawrence, Mass., has been purchased by Everett Archibold, C. T. Howe and Thorndike Howe. E. A. Archibold retires after a long and successful career.

S. C. Van Buren's Son & Co., Carey, O., makers of the Buckeye traction ditcher, have consolidated with the Heck & Marvin Co., Findlay, O., the combined companies to be known as the Van Buren, Heck & Marvin Co., with works and main office at Findlay. The plant at Carey will be equipped for roll work, and will be run under the name of the Buckeye Roll Grinding & Corrugating Co., with D. J. Pease as manager. The Carey firm will shut down for invoice on Jan. 17 and will be doing business in Findlay the first week in February.

ROLLER BEARINGS FOR SHOP SERVICE.

The product of the American Roller Bearing Co., of Boston, Mass., enters into fields remote from the automobile trade, to which the firm has catered for the past few years, and is being adapted to bearings for shop trucks, loose pulleys, line shafting, traveling crane work, etc. The illustration shows the bearing complete with the outer race ring and bevel thrust ring removed. A single bearing consists of an inner sleeve or bushing, the rollers and retainers assembled thereon, an outer race ring and two bevel thrust rings.

It seems so easy to arrange a series of rollers around a shaft and in the interior of a shell bearing that, granted wearing surfaces with the excellent finish of modern workmanship, there would be but little difficulty in obtaining satisfactory results. There is a peculiarity, however, about the roller bearing of such an elementary type which in practice has proved the most troublesome item in the design of a really practical bearing with low coefficient of friction and a high degree of endurance. We refer to the necessity of maintaining absolute parallelism between the rollers. It was speedily discovered that when the rollers lost their parallelism they would lose their line contact and would bear at their centers on the



AMERICAN ROLLER BEARINGS FOR SHOP SERVICE.

inner race and at their ends against the outer race. A heavy cross bending strain was brought to bear upon the rolls under these conditions and they were frequently broken. This promptly established the fact that it was not practicable to place the rollers side by side and trust to their wearing evenly and maintaining their parallelism unassisted. Some device for preserving them in accurate parallel adjustment was essential.

Of course another feature of importance is the provision for some form of separator; otherwise the adjacent surfaces of rollers rotating in opposite directions will exert a rubbing friction against each other that would defeat the very object of the bearing. Many devices have been adopted for the purpose of guiding the rollers, among which may be mentioned the use of end slots, cages and pivots mounted in cages. Still another solution is offered in the accompanying illustration. The bearing in question consists of a series of large rollers separated by smaller ones which are mounted between the centers of the main rollers and serve to prevent them coming in contact. The separators which in common with the main rollers and the races are made of hardened steel of high tensional strength, have rolling supports at the ends, this support being afforded by the retainer caps. These enlarged ends of the separators bear on the races in the cups and are so proportioned that they travel around in unison with the main rollers without slipping or dragging. Even at the slower speeds, centrifugal force keeps the separating rollers in contact with the retainer caps, so that they have no bearing on the sleeve. And in turn this inner sleeve prevents them from dropping out of place when the speed is considerably reduced. The main rollers are kept in position by their beveled ends bearing against the beveled and enlarged ends of the separators, instead of employing cages for this purpose. Before any given bearing could get out of lateral adjustment or swing around out of parallel with the axis of the bearing it would have to stretch and break the shank of the steel separators. In other words, the entire tensile strength of the separators is available to keep the bearing in absolute alignment.

The firm is introducing these bearings for service on line shafts under conditions of some degree of interest. The arrangement is described as follows: "We get all the information as to the power used in a plant, the power consumed by the shafting running idle, and other conditions. With these facts we make up a memorandum of agreement which we submit to the mill owners, in which we guarantee to save a certain percentage of their power as shown by readings from the engine indicator. If we fall short we allow a rebate on the contract price conforming to the amount of the falling off. This method fully protects the owner and enables him to see just what the investment is worth to him."

New Mechanical Publications.

Fowler's "Mechanical Engineers Pocket Book" for 1903 contains 432 compactly arranged pages of general information, tables and data. It is published yearly and it is stated that a goodly portion of the articles has been rewritten for the present issue. Not the least interesting and useful part of the book is a comprehensive index which has the drawback of being interleaved with advertising matter. This is not altogether objectionable, as it doubtless explains the publication of a book of this kind and size at such a nominal price. The net price is 1s. 6d. in leather; with gilt edges, 2s. 6d. The publishers are the Scientific Publishing Co., Manchester, Eng.

"The Civil Engineers' Pocket Book," by John C. Trautwine and subsequently revised by John C. Trautwine, Jr., and John C. Trautwine, 3d, now extends to 1,079 pages in the recently issued 18th edition. The latest work has had the addition of some 370 pages of new matter and is larger by about 100 pages than its recent predecessors. Many of the articles have been rewritten and extended and in some cases, as in the new and greatly enlarged tables of logarithms, arranged in a somewhat novel form. The articles on statistics, beams and trusses have been rewritten and completely modernized and there is a new feature in the digest of prominent specifications for bridges for steam and electric railroads and highways. In these improvements and in other features the editors of the work have had the assistance of prominent authorities on the subjects treated. The new matter is very fully illustrated and as heretofore all cuts have been made expressly for this work. The price is $5 net, and the book is published by John Wiley & Sons, New York.

A company is being organized at Wheeling, W. Va., to manufacture the Davies car wheel. Until the new plant is erected, the wheel will be manufactured by the Wheeling Mold & Foundry Co.

The addition to the plant of the Deming Co., manufacturer of pumps and hydraulic machinery, Salem, O., is nearing completion. It is 226x86 feet, with transept 48x25 connecting to the company's offices. There will be a 33-foot span traveling crane running from end to end in the center of the building.

W. A. Stratton, of Louisville, and Henry Gohmann, of New Albany, Ind., members of Stratton & Terstegge, stove manufacturers, Louisville, have purchased the Gohmann interest in the stove foundry at New Albany of Terstegge, Gohmann & Co. The foundry will continue to be operated and the sales department will remain in Louisville.

THE SAVOY AND SIBLEY MINES' NEW HOISTING PLANT

The accompanying illustrations represent the new double-drum Corliss hoisting engine, built by the Sullivan Machinery Co., of Chicago, which was recently installed at the Savoy-Sibley shaft of the Oliver Iron Mining Co.'s mines, near Ely, Minn. This plant presents a striking appearance, occupying a floor space of 42x32 feet, and being of very powerful and heavy design. Its total weight is 176 tons. It represents the most advanced type in hoisting machinery for the iron mines of the Lake Superior region, and is thoroughly modern in construction. The hoist is of the double-drum, direct-acting type, the drums being loose on the engine shaft, and driven with band friction clutches. Two hoisting shafts are operated by the hoist, each drum hoisting in balance from the two compartments of one shaft.

The drums are 10 feet in diameter, with 9-foot winding faces, provided with spiral grooves for 1⅜-inch round rope. The gross load which each drum is capable of lifting is 20,000 pounds, and 7 tons of ore are raised at each trip. Each drum is provided with two heavy band or strap brakes, which operate simultaneously. The powerful band friction clutches are located at the centers of the drums. The drum shafts are 36 feet long by 14 inches in diameter, supported by three bearngs. There are two auxiliary rope reels, located inside each main drum, for taking up the slack of the hoisting ropes.

The engines are of the Corliss pattern, 28x60 inch girder frame, steam jacketed throughout, of 1,500 horsepower. When operating, the boiler pressure is 125 pounds, which is, however, increased to 150 pounds in case of accident to the condensing apparatus. The maximum hoisting speed is 2,000 feet per minute, controlled by a quick-acting governor in connection with the Corliss valve gear. The engine-reverse gear is of the steam-actuated spiral type. The brakes and clutches are also operated by steam, and the brake engine, clutch engines, and reverse engine are provided with oil-cataract cylinders, the object being to prevent sudden or jerky movements of the various parts.

In addition to the main steam brakes above mentioned, there are two sets of auxiliary brakes, one set being operated by compressed air and the other by a handwheel on the engineer's platform. A special feature of the brake gear is the automatic pressure valve, which will automatically substitute air for steam or steam for air, in the case of failure of either operating medium. The machine is fully equipped with all modern safety appliances. These include positively actuated stops to prevent overwinding, dial indicators to show the position of the cages in the shafts, and automatically operated throttle valves for shutting off steam near the end of the hoist. There is also a small auxiliary throttle valve for controlling the engines after the main throttle has been automatically closed. This is operated by a step on the engineer's platform. Each Corliss cylinder is provided with two by-pass valves for connecting the two sides of the pistons when lowering. The engineer's platform is raised above the floor, and all hand levers and safety appliances are within easy reach of the operator.

A hoist of similar type, with but one 12x8½ foot drum, is operating on the Pioneer A shaft nearby. The Sullivan Machinery Co. is also building two heavy hoists of the type above described for the Oliver Iron Mining Co.'s mines at Norway, Mich.

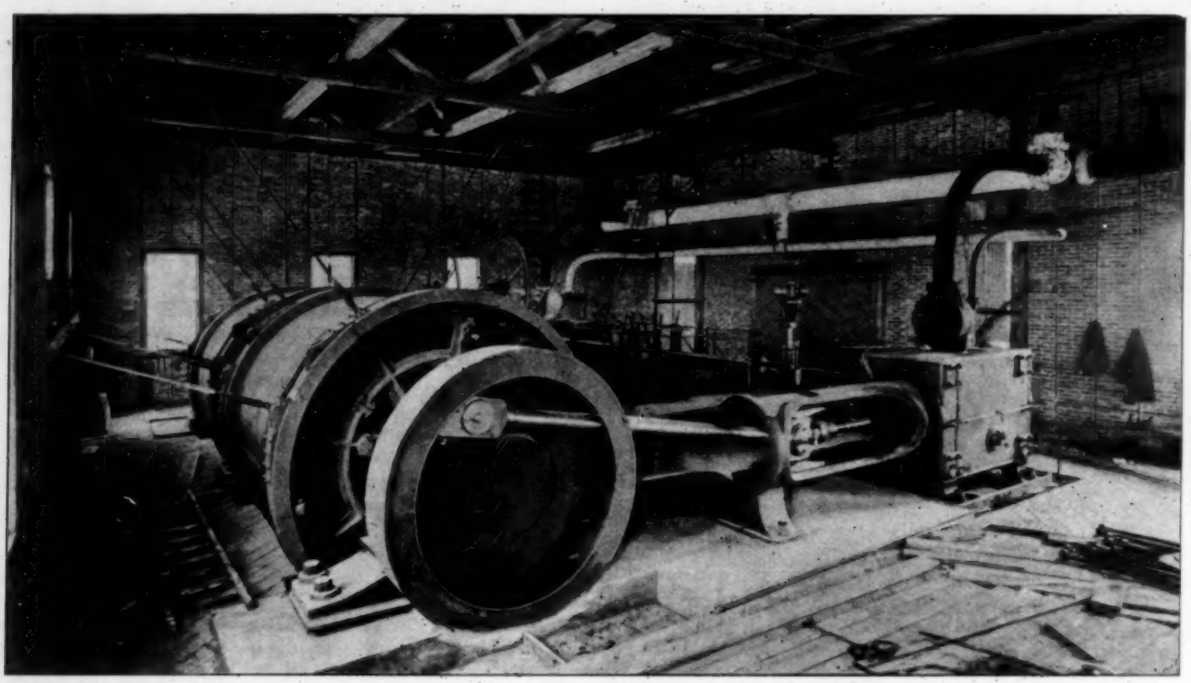


FIG. 1.—HOISTING PLANT AT THE SIBLEY AND SAVOY MINES, NEAR ELY, MINN.

During the last two months the Illinois Central Railroad's big coal pile at Gwinn, Miss., has been on fire, the blaze having been caused by spontaneous combustion. After trying for weeks to extinguish the fire, it was decided the coal must be moved. Steam shovels were brought into requisition and in nine days removed 15,000 tons of coal. It was necessary to keep a hose playing on the pile of coal all the time, and even with this precaution, four cars were set on fire by the hot coal. This is the first time that a steam shovel has ever been used for such a purpose. The "Giant" boom type, built by the Vulcan Iron Works Co., Toledo, O., was employed.

The fire which recently damaged the property of the Columbus Bolt Works, Columbus, O., occurred in a comparatively small rented building some distance away from the main works, where were operated some threading machinery on large size bolts. It had been a foundry and there was nothing combustible, except the roof. The fire caused no injury of consequence to the machinery, which has been re-located and will be in operation in a few days.

The American Steel Foundry Co., of Granite City, Ill., has completed plans for an all-steel box car, which it is claimed will be stronger, lighter and of greater carrying capacity than the ordinary wooden car now in use.

PRIORITY IN THE PREMIUM WAGE SYSTEM.

To the Editor:

In commenting upon an address which I gave to students of the Wharton School of Finance, University of Pennsylvania, in your issue of Dec. 25 last, you say: "'The Premium System of Wage Payment' is the title of an article in the January *Annals of the American Academy of Political and Social Science*, by A. E. Outerbridge, Jr., of Philadelphia. The question of priority is of little consequence in comparison with the other matters involved, but it is unfortunate that a more definite distinction between the methods respectively devised and advocated by Fred W. Taylor and F. A. Halsey has not been made. Very many people credit Mr. Halsey, in fact, with being an early worker in this field, probably prior to Mr. Taylor's work at South Bethlehem and elsewhere; but no mention of this pioneer labor is linked to the former's name."

I certainly did not intend to slight Mr. Halsey's excellent work, but I am under the impression that Mr. Halsey's premium system of paying for labor (which was an improvement, I believe, on the plan devised by Henry R. Towne, and applied by him at the Yale & Towne Mfg. Co., at Stamford, Conn.) was formulated several years after Mr. Taylor's "differential" system had been successfully introduced at the Midvale Steel Works.

In his paper on "A Piece Rate System" presented at the Detroit meeting (June, 1895) of the American Society of Mechanical Engineers, and forming part of Vol. XVI. of the *Transactions*, Mr. Taylor says:

"The system of differential rates was first applied by the writer to a part of the work in the machine shop of the Midvale Steel Co. in 1884. Its effect in increasing and then maintaining the output of each machine to which it was applied was almost immediate, and so remarkable that it soon came into high favor, with both the men and the management."

Mr. Towne described his system, invented in 1886, in a paper read before the American Society of Engineers in 1888. Mr. Halsey presented his paper on "The Premium Plan of Paying for Labor," before the same association in 1891, and I have been informed by Mr. Carl G. Barth, a co-worker with Mr. Halsey at that time, that Mr. Halsey devised his method shortly before he read this paper.

I quite agree with you that there is a radical difference between the systems of Mr. Taylor and Mr. Halsey, but this does not necessarily invalidate the statement I made that Mr. Taylor's plan "may perhaps be regarded as the pioneer of all of the premium systems in use today." At least 30 years ago a premium system of paying car wheel molders was devised by the late William Helme and put into practical operation at the car wheel works of A. Whitney & Sons, Philadelphia, but as this was limited in its scope, and as there are no published records of the principles involved, I did not allude to it in my paper, which was merely an abstract of part of my address to the students of the University, the title of which was "The Value of the Personal Equation in the Management of Men."

ALEX E. OUTERBRIDGE, JR.

Philadelphia, Pa., Jan. 9, 1903.

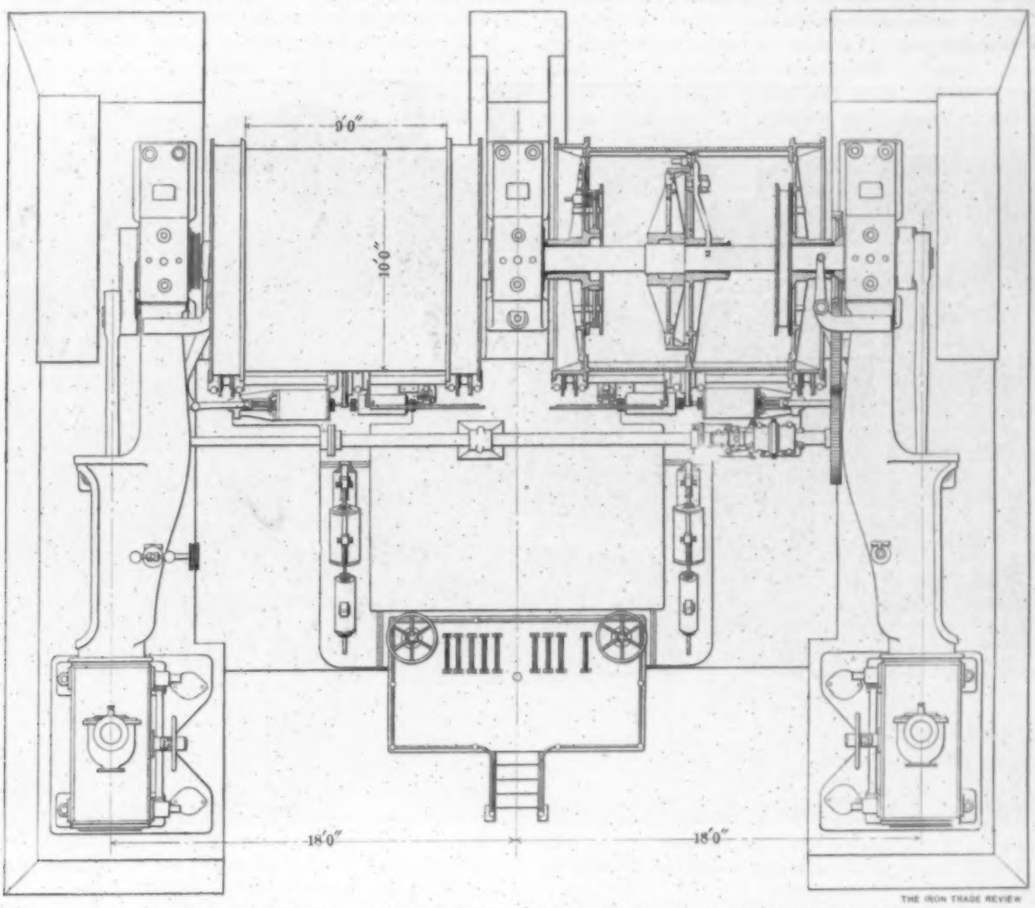


FIG. 2.—PLAN OF THE HOISTING PLANT AT THE SIBLEY AND SAVOY IRON MINES.

Wm. Wehrle, of Newark, O., has made a proposition to the board of trade of that city to build a large addition to his stove foundry and increase his force to 1,250 men, and the James E. Thomas Co. has agreed to erect an additional iron foundry, employing 200 more men, providing the board will sell 200 lots, into which the Forry farm will be divided, at an average price of $250. At a meeting Tuesday night almost enough lots were sold to guarantee the project. The plants will cost $250,000.

At the Rankin, Pa., plant of the American Steel & Wire Co., an order calling for 27 miles of wire to construct an overhead trolley system at Tokio, Japan, is being filled.

A FORTY-FOUR FOOT PIT LATHE.*

BY JOHN M. BARNAY, CINCINNATI, O.

The machine here described was designed to meet the demands of a manufacturing establishment of the heaviest type of electrical machinery. The ever-increasing dimensions of this class of machinery make it particularly desirable that the existing heavy machine tools should be capable of extension of capacity with a view to probable future requirements and that a pit lathe is peculiarly adapted to such extension will doubtless be readily admitted. The face plate of this machine measures 30 feet in diameter, and the present dimensions of the pit will admit of swinging 44 feet on centers, with a maximum width of 12 feet. The large face plate is built up of twelve segments. The rim is of box section, the ends of the rim in each section being finished to make the joint, and the segments being held together at the rim by body-bound bolts. The arms are slotted for bolts, and the space between segments is also shaped to receive the usual square-headed bolts, as the inner end of each segment is fastened to the smaller face plate by several body-bound bolts.

The smaller face plate is cast in one with the forward section of the spindle. The spindle revolves in a babbitted bearing measuring 48 inches diameter by 68 inches long, the dimensions of the rear bearing being 22 inches diameter by 28 inches long. It is calculated that the pressure on the main bearing will, at times, attain a maximum of 125 pounds per square inch.

Teeth were cast into the periphery of the 12-foot face plate for the purpose of driving same while turning up the spindle bearing, which operation is illustrated in Fig. 1. After the spindle was finished by this method the segments of the large face plate were bolted on, the spindle assembled on the headstock, and the periphery of the 30-foot face plate turned off, with the spindle in its own bearing.

A feature of interest in connection with this machine is the method of drive adopted, which is a friction roller, 18 inches diameter, made of compressed paper, while the rim of the large face plate, 15 inches wide, affords the necessary contact surface for driving. Power is supplied by a 75-horsepower motor, quadruple geared, the use of the multiple voltage system giving the machine a range covering all diameters from six feet to the present capacity, though the gear train is designed to admit of two changes of back gear in addition. The tool carriages are supported on massive cast iron columns resting on the bottom of the pit, and the feed mechanism is driven by an independent motor properly back geared. By the use of the multiple-voltage controller, and a device called a feed regulator, any rate of feed from 3-64 inch to 2¾ inches per minute can be had without a change of back gears. There was also designed for this machine an outboard bearing to support the outer end of mandrils and boring bars, which is provided with a geared sleeve connected to a train of back gears driven by an independent motor; the whole being self-contained and constituting a portable boring and facing tool. An approximation of the total amount of cast iron used in the construction of this machine places the weight at 480,000 pounds, of which the spindle and two face plates together weight about 155,000 pounds.

As would be expected in this class of tool, the center of gravity of the revolving parts lies very close to the edge of the pit; hence, the matter of a substantial foundation became one of considerable importance, and to meet the severe requirements the design of the headstock provides a large area for the distribution of this pressure, so that the forward part of the headstock alone covers an area of 68 square feet. The masonry foundation consists of a layer of the best Portland cement grouting on top, followed by a 5-foot layer of vitrified brick, which in turn rests on a massive column of the best grade of pressed brick, all laid in first quality Portland cement.

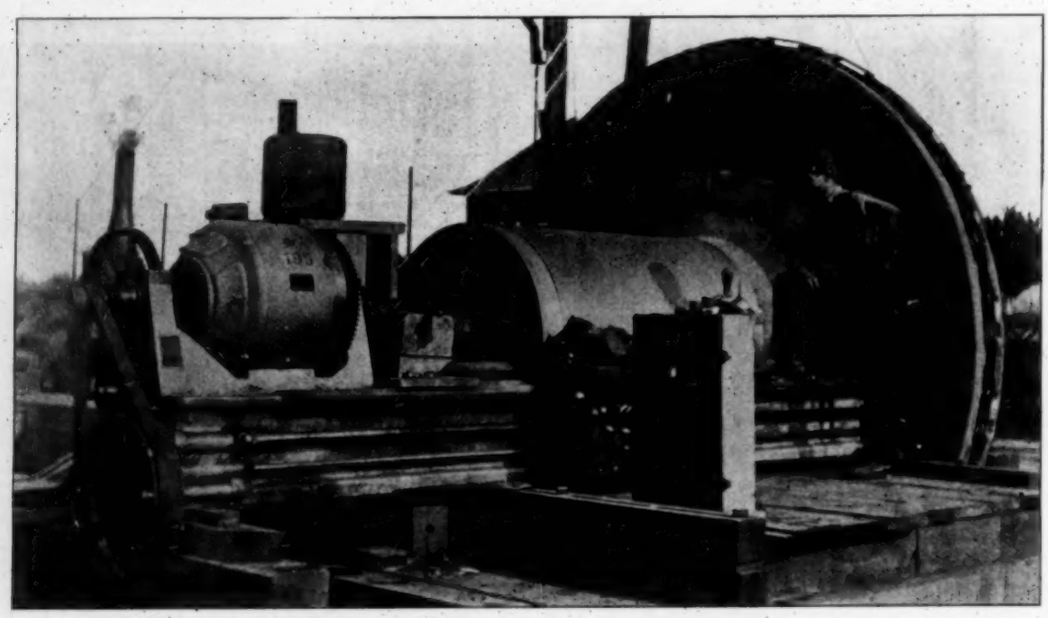


FIG. 1.—TURNING THE SPINDLE BEARING FOR 44-FOOT PIT LATHE.

Fig. 2 shows the assembled pit lathe driven by the friction roller while taking a heavy facing cut, on which occasion four tools were employed. The picture also shows the driving motor with its train of gears and the mechanism employed for adjusting the pressure on the friction roller.

*Read at the New York meeting (December, 1902) of the American Society of Mechanical Engineers.

The net earnings of the Tennessee Coal & Iron Co. for the year ended Dec. 31, 1902, are estimated at about $2,600,000, as compared with $1,724,000 in the preceding year. Fixed charges, preferred dividends, sinking fund and depreciation will amount to approximately $1,270,000, leaving a balance of $1,330,000, which amount will in all probability be appropriated for betterments, it being the policy of the company to use surplus earnings to build up the property.

The American Car & Foundry Co. has declared a quarterly dividend of 1 percent on the common stock, an increase of ½ percent over the last payment. This places the stock on a 4 percent basis. The usual quarterly dividend of 1¾ percent on preferred stock also has been declared. The earnings of the American Car & Foundry Co. for the quarter ended Nov. 30 were $2,150,000.

O. A. Wyman is moving his machine shop from Austin, Minn., to Minneapolis.

A WROUGHT- AND CAST-METAL PROCESS.

A process of making welded cast metal has been recently patented by William Kent, of Struthers, O., and is described by the inventor as follows:

"In the use of iron there are often cases where the rigidity and hardness of cast iron or steel is needed without the tensile strength of wrought iron or steel, and yet because the cast metal is brittle it cannot be used for fear of breaking under accidental jars and sudden strains. On the other hand, to use enough of the wrought metal to obtain the desired rigidity involves too great expense and requires too great a bulk of metal. The essential difference between the hard cast or high carbon metal and the soft wrought or low carbon metal is not so much chemical as structural. The former is crystalline, having no fiber. The latter is laminated in structure with a long fiber or 'grain' in the mass. The best puddled iron, even when it has more carbon than certain cast steels, is yet tougher and more malleable than the latter. It is therefore plain that the toughness is due to the internal structure, the fibrous weaving that is attained by the mechanical operation of puddling and rolling. The object of my invention then is to produce this kind of structure in a composite metal by interspersing filaments of wrought iron or steel in a mass of cast iron or steel in the act of casting and weave them in the mass by rolling rather than by mechanically mixing by stirring in the puddle while the metal is liquid.

"Certain irons, like 'Bessemer cast,' for example, while they may be rolled when hot, become brittle when cold. I prefer to use this class of cast metal, and I give it tensile strength and overcome its brittleness by incorporating in its mass various fibers of wrought metal welded in with it.

"The cold wrought iron or steel is arranged in an ingot-mold, so that the size of the pieces varies inversely with the distance of the piece from zone of greatest heat—that is, the center of the mold. Then I pour in the molten high-carbon iron or steel at a sufficient temperature to fuse the wrought metal, when the heat imparted to it brings it to the welding state and the two become thoroughly welded together. The oxide in the fusing and in the subsequent rolling is displaced and allows full welding, while itself adding strength to the composite metal by toughening the grain. The ingot may then be rolled into the desired form, and the metal will have in a large measure the qualities of both cast and wrought metal, these qualities being improved by rolling and working, which more intimately incorporates the two metals and further intermixes the oxide slag.

"By properly proportioning the amount of wrought metal and properly locating it so that the largest pieces get the greatest or longest exposure to the heat of the molten metal a thorough welding takes place. I may use wires or bars of new iron, or old chains, or loose scraps or cuttings, or a specially-designed structure to distribute the metal evenly.

"After the casting step, by which the wrought metal is distributed in the mass of cast metal in various small masses, so arranged as to facilitate the welding and the subsequent distortion and compression due to rolling, (placing more wrought metal in the interior for this purpose,) the masses of wrought metal and the oxides must be interwoven in the mass to get the desired internal structure. The ingot is then heated in the 'pickling' or cementation furnace, softening without oxidation to fit it for compressing, and is then rolled and worked up thoroughly, during which step of the process these small masses of wrought metal and oxide are entirely broken down, displaced, and interwoven throughout the mass of cast metal, this distribution being facilitated by the fact that the cast metal is harder and the wrought metal crushes easily. The result is that the cast metal itself is given a striated or fibrous structure rather than the crystalline, and there are woven all through it the filaments of wrought metal irregularly distributed in somewhat the manner attained by puddling. It is this internal weaving of the fibers which gives the desired quality and which is the object of this process.

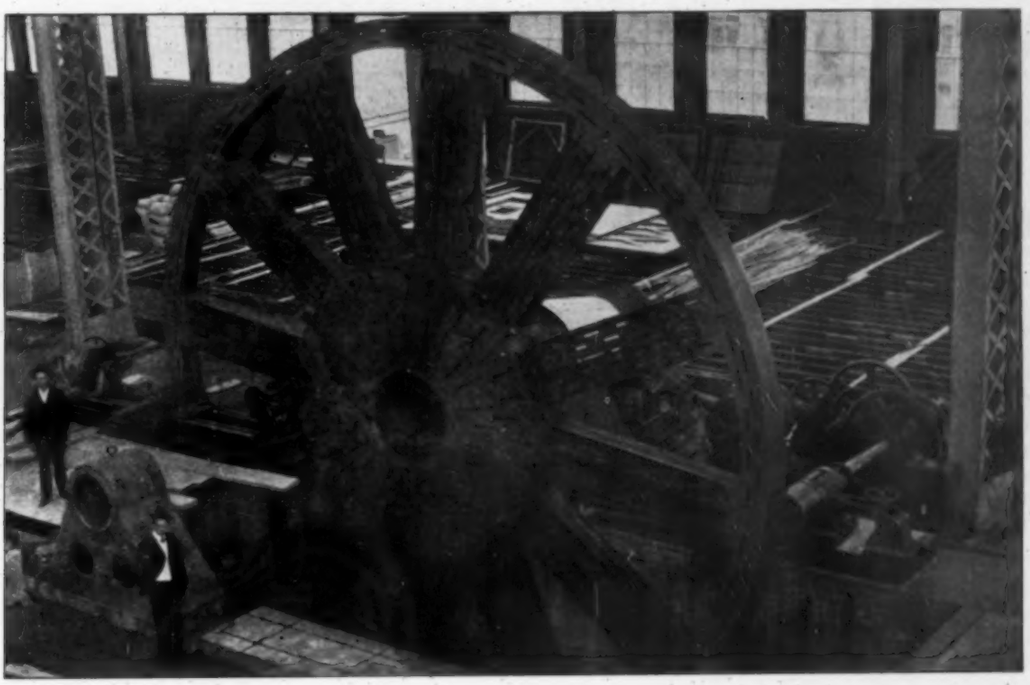


FIG. 2.—THE ASSEMBLED 44-FOOT PIT LATHE.

"Probably the properties and the function of my composite metal may best be illustrated by referring to its adaption to use in armor-plate. In the former making of armor-plate malleable metal was used, and in that case the penetration of the projectile did not destroy the plate or do any more injury than results from the penetration of wooden sides. It was afterward sought to prevent penetration by hardening the metal; but in this case even the slightest penetration of the projectile causes the entire disruption of the plate, because of its brittleness. The first attempt to overcome this difficulty was made by Warden in 1862, when he cast a plate about a central

framework of wrought iron. In case of fracture this had an action similar to the action of hair in plasterer's mortar —that is, it did not serve to prevent a fracture in any degree, (the two metals not being welded together,) but merely served to prevent the pieces from entirely dropping apart after they were fractured. Now my invention is designed, first, to use for the main bulk of the metal a cheaper grade of iron or steel; second, to form a hard resisting outer surface to prevent as much as possible any penetration of the projectile, and, third, to provide the metal with a laminated fibrous structure, giving it tensile strength, so that it will withstand a very heavy blow without producing a fracture—that is, a plate will have the advantage of hardness and rigidity, due to high carbon or cast iron or steel, and yet avoid their objectionable brittleness, so that less weight or thickness need be used to obtain the same resistance to breaking. The plate will hold together even when entirely penetrated, and at the same time the resistance to penetration that was obtained in the cast-steel plate is preserved.

"The process when applied to the manufacture of shafting, rails, and structural iron, particularly for columns, is even more valuable, for there are many places where cast columns may not be used because of the danger that a sudden jar will rupture them, while, on the other hand, malleable columns may not be used because they have not sufficient rigidity.

"Of course this composite metal may be used in directly casting articles in their final form—as, for example, large shafts and columns; but the filaments of wrought metal must be distributed throughout the whole mass, and the process is distinguished from those in which the wrought metal is merely embedded in the cast metal."

Combine of Metal Tile and Ceiling Industries.

An effort is being made to consolidate the pressed metal industries of the country, the new company to be called the Standard Metal Tile Corporation. Mr. J. C. Heynman, of Pittsburg, who has been active in the matter, has been quoted as saying: "No details can yet be made public. A combination of all the metal industries of the country is in view. There has been particularly strong competition between the producers of metal ceilings. This, coupled with the high price of labor, is ruinous to many manufacturers. The producers of metal tile and metal ceilings are combining merely to protect their own interests."

To Be the Largest Furnace in the South.

President Elliott, of the Southern Car & Foundry Co., with works at Gadsden and Anniston, Ala., and Memphis and Lenoir City, Tenn., is making arrangements to have the Jupiter furnace removed from St. Louis to Alabama, where it will be rebuilt with all modern improvements. When rebuilt the furnace will be 99 feet high and 20 feet bosh, making it the largest furnace in the South.

The Board of Trade of Williamsport, Pa., has issued a bulletin showing what companies are now operating in that city, or will be at an early date, as the result of the efforts of the board. Among the companies are the following: Williamsburg Clutch & Pulley Co., the successor of a company formerly doing business in the state of New York, whose plant was partially destroyed by fire in May last; the Hermance Machine Co., the Rudio-Buff Foundry Co., and Kemp & Foulk, founders.

The number of cars manufactured by the Pressed Steel Car Co. during December exceeded the output of any month since the company was formed. The output averaged about 104 cars per day. The earnings during December also surpassed all monthly records.

The British iron and steel firm of John Hall & Co., Ltd., has placed orders with the Jones & Laughlin Steel Co., of Pittsburg, for considerable steel shafting for shipment to England.

TRADE PUBLICATIONS.

The short story of Sir Joseph Whitworth, presented by Wyman & Gordon of Worchester, Mass., is accompanied by a circular soliciting further facts in regard to the proposed publication of biographies of American pioneers of industry. A list of these is submitted for examination and the company invites the addresses of interested individuals and firms for use on the mailing list.

The tale of the Greenerd arbor press, issued by Edwin E. Bartlett, of Boston, will be of special interest to those seeking a better method of driving arbors or mandrils. Eight sizes of these arbor presses are now manufactured, taking work from 5½ to 36 inches in diameter and arbors up to 7 inches. The pamphlet is not however confined to arbor presses but presents the "Federal" planer, "Federal" planer chucks, "Federal" planer centers and a 10-inch slide rest. Not the least noteworthy part of the work is an ingenious acrostic which introduces the firm names of over half a hundred customers and incidentally suggests the large number not so mentioned.

The line of universal vises manufactured by the Emmert Mfg. Co. of Waynesboro, Pa., is described in a neatly printed pamphlet. The list includes the pattern-makers' vise described in the series of articles in *The Iron Trade Review* which appeared concurrently with the Pan-American exposition as well as the later vise for metal workers which was freely illustrated in these columns on Oct. 23, 1902.

A dainty litle pamphlet discusses the Buffalo system of heating, ventilating and drying. Many excellent halftones illumine the text and the Buffalo Forge Co. of Buffalo, has evidently spared no pains in the appropriate presentation of the latest product.

The monthly stock list of Wickes Brothers of Saginaw, Mich., enumerates a wide range of new and second-hand machinery for wood and metal working.

The Atlas Car & Mfg. Co. of Cleveland, has a new catalogue, No. 1008, illustrating a line of cars for use in and around brick yards and cement plants. The work is standard size, 6x9 inches, and extends to 48 pages. The company has also a circular of the same dimensions but only 10 pages treating of industrial railroad equipment. This catalogue is known as No. 1012 and contains but a selection of the cars, switches, etc., handled by the company.

"Rock Crushing Plants" is the title of catalogue No. 5, 10th edition, prepared by the Allis-Chalmers Co. of Chicago. The pamphlet is a well bound and admirably printed book of 55 pages, standard size and contains many line and halftone engravings. These include a number of views of the different plants of this firm.

The Archer Iron Works of Chicago, have issued the 10th annual catalogue treating of the varied product of the company. This includes steel wheel barrows, lumber carts, trucks, steel ore and coal cars, wheels of all kinds as well as ornamental and structural iron work.

The Brady Brass Co. of Jersey City, N. J., and the Forsyth Pattern Works, of Youngstown, O., have some specimens of extremely fine color printing in calendar form.

The 1903 catalogue of the Pittsburg Gage & Supply Co., of Pittsburg, is a ponderous cloth bound affair, some 640 6x9-inch pages with numerous illustrations. The firm is a manufacturer and jobber of mill, mine, machinists and railroad supplies and engineering requirements in these lines are broadly covered; in fact the company goes to the extent of acting as contractor for the equipment of complete steam power plants. The pages are interleaved with many halftone illustrations on tinted paper showing the interior and exterior views of the offices, warehouses and shops. An admirable feature of the production is an index with marginal letters in plain sight for immediate reference. Altogether one can readily credit the assertion that the book was six months in course of construction; such enterprise is most creditable.

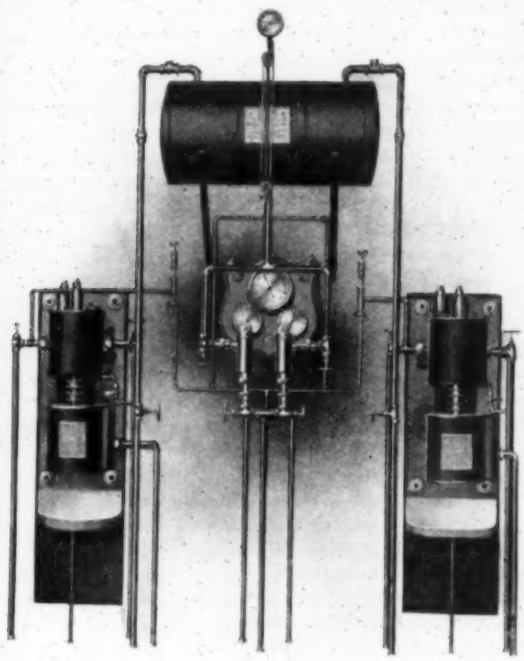
Catalogue N. 56 is 6¾x9¼ inches with 131 pages relates to mower and reaper knives and repairs and supplies manufactured by Henry & Allen, of Auburn, N. Y., and for use on agricultural implements of all kinds.

UNIQUE SYSTEM OF LUBRICATION.

A lubricating system designed and patented by J. L. Pilling, general manager of the Port Huron Air Tool Co., of Port Huron, Mich., has been installed in the plant of the Consolidated Railroad at Washington, D. C. The illustration shows the plant as it appears above the floor line.

There is an air receiver located beneath the engine room into which air is compressed to a pressure, as for example, of 60 pounds. At a convenient place in the basement is situated a ten barrel tank into which the oil is run in the first place. There is a pipe running from the receiver to the tank, which is sealed. On top of the original receiving tank is a filter connected with the tank with a check valve between. When oil is required up in the distributing tank, such as is shown in the illustration the operator opens the valve adjacent to the appliance shown, admitting air into the original receiving tank and forcing it up into the distributing tank. There is a pressure reducing valve between the receiver and the distributing tank which keeps any desired pressure on the latter. A safety valve is connected with the return pipe.

Two pressure filters are placed underneath the distributing



THE PILLING SYSTEM OF LUBRICATION.

tank. Each of these may be shut off and cleaned at will while the other is in operation. Main lines are run from the bottom of the distributing tank and connected to every main bearing in the plant regardless of the extent of the machinery. The pressure being constant the feed acts in unison and the oil is managed entirely without hand adjustment.

The return oil is taken from the sole plates leading back to the filter on top of the original receiving tank having a gravity fall into the receptacle. The check valve already mentioned as being located between the filter and the tank acts in such a manner that when the pressure is placed on the tank to blow air up into the engine room tank the check prevents the pressure going back into the filter. The inventor also runs a line from the receiver whenever it is desired for cleaning dynamos, blowing off switch boards, whitewashing basements, or for any other purpose where compressed air can be utilized.

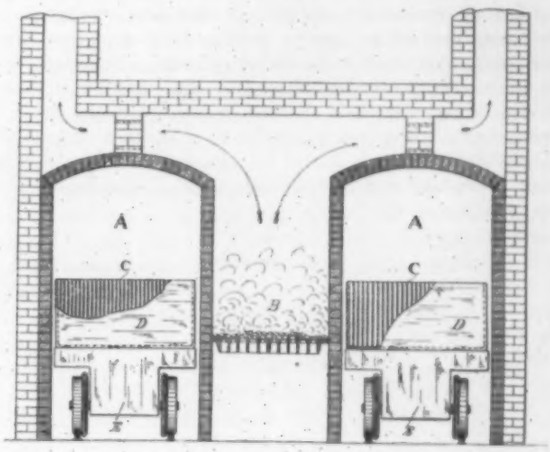
These lubricating systems have been installed at the Armour Central Station, Chicago; the Baltimore & Ohio Railroad electrical generating plant, Edgewater, Chicago, and the New York & Staten Island Electrical Co., as well as at the Washington plant mentioned above.

R. G. Sommerfeld, H. S. Evans, J. S. Lucock and T. R. Evans, all of Pittsburg, have applied for a charter for the Sommerfeld Machine & Mfg. Co., of Pittsburg. The new company will erect a plant to include a foundry and machine shop.

IMPROVED PROCESS FOR BLACK PLATES.

Jenkin Howell and Samuel J. Drew, of Joliet, Ill., have obtained a patent on a process of treating metal plate which is intended to improve the furnaces, obviate costly annealing pots and decrease the time hitherto required. The invention pertains particularly to black annealing at a reduction of cost, with an increased capacity. The method is described as follows:

"In the manufacture of tin plate after the plates are removed from the pickling bath they are washed in water to remove the deposits of the pickling, then placed flatwise in annealing pots, which are run into reverberatory furnaces until the plates are red hot, after which they are allowed to cool, when they are ready for the rolls or for further treatment. In so treating the plates they must be separately handled—once when placed in the pickling bath, a second time when taken out of such bath, and a third time when placed in the annealing pots. In spite of great care in the washing and annealing of these plates in the manner described, foreign substances adhere to the plates from the pickling bath, which result in the formation of green and other patches during the annealing, with the result that the plates so damaged are rendered entirely unmerchantable or are much reduced in value. Referring to the drawing in detail, A represents the furnace ovens; B, the fire-box; D, the annealing boxes



CROSS SECTION OF ANNEALING FURNACE.

supported on wheeled trucks E; C, the plates arranged on edge in the boxes.

"In the application of the process we take the plates after they leave the pickling bath and while set on edge in the annealing boxes and wash them with a weak solution of hot water and muriatic acid, about 1½ gallons of acid being used to 100 gallons of water in the solution. After so swilling the plates we subject them to a final washing of lime water, in which we use 100 pounds of lime to 100 gallons of water. The weak acid bath removes the deposits left on the plates from the pickling bath or makes them solvent, so that they may be effectively removed by the bath of lime water referred to, so that when the plates are ready to go to the annealing furnace they are clean and sufficiently warm from the hot acid solution and the hot lime water to almost dry them. The plates are left in the same pots in which they have been pickled and swilled and in the same position—i. e., on edge and not in contact with each other—and are run into the annealing furnace, where they are subjected to superheated air, which is permitted to come in direct contact with the faces of the plates by reason of their position. The dry heat of the furnace ovens quickly takes up any moisture which may be left on the plates and they become quickly and thoroughly heated, the annealing being accomplished in much less than the usual time."

Joseph F. Rothe, St. Paul, Minn., will build a foundry 70x108 feet.

The Metric System.*

BY F. A. HALSEY.

The pro-metric argument is, substantially, an a priori argument. The metric advocates adopt the methods of the old philosophers who laboriously sought to prove what ought to be. My method is that of modern science, which interrogates nature in order to learn what is. For instance, they tell us how easily and how quickly this nation ought to make this change; I shall show how slowly and laboriously France and Germany have made the change. They will say that we ought to adopt this system to please our foreign customers; I shall show that our foreign customers do not care one picayune whether we adopt it or not, and I shall prove it by a flood of evidence.

The testimony before the House committee at Washington is sprinkled with opinions that this great change can be made in from three to five years. In this matter we do not, however, need to regard opinions at all, but may apply the scientific method at once and consult the facts. With the presentation of this paper there are offered for inspection a collection of French and German books from the library of the *Textile World*. These books present a condition of things which is absolutely startling. As instructive as any is a little German book of 105 pages, "Calculator for Articles in the Textile Industries," by Friedrich Frowen, third edition, 1901. The object of this book is to give a simplified system of calculating for textile fabrics, and it discloses a condition of things in German-speaking Europe compared with which our own is simple indeed. This condition is due to the fact that there are still in use nine different ells in addition to the metre and the English yard. These ells are divided into inches, an inch ranging all the way between 1-20 and 1-36 of an ell, and such extraordinary ratios as these being still in use:

Prussian ell.....25½ inches.
Würtemberg ell.....34¼ inches.
Vienna ell.....29½ inches.

In brief the book shows that there is still in use in German textile mills an absolute medley of ells, inches, yards, metres, kilograms, and pounds, combined with a vast number of systems of yarn numbering based upon these different units of length and weight, while towering above all these systems of yarn numbering are found the English yard and pound in all branches except the silk industry, in which the metric system cuts a very small figure.

In the *Textile World* for October, 1902, is an article by Mr. Dale, into which he has lifted bodily one of Frowen's simplified calculations of the cost of a piece of worsted cloth, and to it he adds this description of the operations performed:

"The raw material is purchased by the English pound. The finished goods are sold by the French metre. The yarn counts are English, while the length and width of the finished goods are metric. The length of the yarn is expressed in metres, while the counts are English, based upon the yard and the pound. From this hodgepodge the weight of the yarn is calculated in grams; which is extended by another arithmetical somersault at a price given in marks per English pound, and to cap the climax the total length of the yarn in metres is reduced to English yards and then to English skens of 560 yards each.

"There is no theory here. This estimate is an example of German practice at this moment, and yet men can be found who say that the metric system was adopted in Germany in two years without inconvenience, some asserting they were present when the trick was done; and stranger still, other men can be found who believe it."

Note that this example is relatively a simple one, because it contains none of the ells nor inches, but relates to yards, metres, pounds, and grams only. It hence represents exactly the condition which the adoption of the metric system would bring about in our own mills.

A second German book is "Garn-Numerirungen, Haspelungen und Vergleichende oder Umrechnungstabellen" (Yarn Numbering; Reeling, and Comparative Reckoning Tables), by Heinrich Kutzer, 1901. This book contains a great number of tables for comparing and reducing the numerous units of length and weight, and is of wider scope, geographically, than the first one cited. It shows that 21 ells are in use in European countries in which the metric system is nominally established.

A third German book is "Methodik der Binduslehre und Decomposition für Schaftweberei" (A System of Weaves and Analysis for Harness Weaving), by Franz Donant, 1901. This contains an explanation of the various systems of yarn numbering used in German-speaking countries. It is chiefly significant because of the order in which these systems occur, as the English system heads every list except the last, in which there is no English system. Following are the lists:

Cotton—English, French, metric (note the French).
Linen—English, Austrian (no metric).
Jute—English only.
Worsted—English, metric.
Woollen—English, Austrian, Prussian, Saxon, metric.
Silk—Milan, Turin, Lyons, metric.

A fourth German book is "Mechanische Technologie der Weberei" (Mechanical Technology of Weaving), by G. Herman Oelsner, eighth edition, 1902.

This is an elaborate and beautifully printed treatise of 942 pages. In it page after page is devoted to conversion tables giving metric equivalents of Rhenish, Leipsic, and English inches, as well as of Leipsic and Berlin ells and of English yards.

On page 130 may be found the metric equivalents of the following ells: Prussian, Saxon, Brabant, Bavarian, Wurtemberg, Baden, Vienna, English, Danish, Swedish, Russian. On page 74 he refers to the Cockerill system of yarn numbering used in Belgium, and which is based on the length of 2,240 Berlin ells.

On page 75 he refers to six systems of numbering for carding woollen yarn as follows: Prussian, Saxon, Austrian, English, Elbœuf, Sedan.

On page 121 are some striking illustrations of the annihilation of vulgar fractions by the metric system. In a table giving the number of threads per French inch and per centimetre the following mixed numbers occur in the first line: 11 59-131, 31 1-29, 24 106-131, 67 7-29. A footnote to this page states that the French inch is used for gauging the set of fabrics in Switzerland.

The Persistence of Old Units in French Textile Industries.

In France the condition is, if possible, still worse. Illustrating this may be cited "Traite Theoretique et Pratique de Tissage" (Theoretical and Practical Treatise on Weaving), by Paul Lamoitier, 1900. This is a standard French work on textiles of 573 pages. On page 27 may be seen a comparative yarn table giving equivalents of the following systems of yarn counting, which are thus compared because they are still in use:

Worsted—Metric, Roubaix, Reims, Fourmies, English, German.

On page 52 is a similar table for silk—Lyons, Italian metric. On page 60 is a table for cotton—English, French metric (note the French again). On page 63 is an illuminating sentence. Opening a section on yarn numbering for linen, hemp, and jute is this sentence: "On emploie le titrage anglais" (We use the English system of numbering yarn). Following this comes the following beautiful example of how the decimal system has swept all before it in France:

"The lea is 300 yards, or 274.2 metres; 12 leas make a skein of 3,600 yards; 100 skeins a bundle of 360,000 yards.'

On page 88 the author gives a table showing the weight of weft or filling for one metre of worsted cloth by the Fourmies (an old French) system, and on page 87 states that "this table is given because the Fourmies is used to a greater extent than any other system of yarn numbering

*From a paper read at the New York meeting (December, 1902) of the American Society of Mechanical Engineers.

for worsted." In the early part of the book, on page 24, the following may be seen:

"We shall further on study the counts of silk, cotton, linen, etc. We regret extremely these anomalies which obstruct business, lead to serious errors, and wantonly complicate all calculations."

Perhaps the most curious example of all in the French textile industries is the count of the weft threads in the fabric—the number of "picks" of the loom. Here, if anywhere, it would seem to be easy to introduce the centimetre, but nevertheless the French weaver counts his picks by the inch (pouce), and (save the mark!) 37 French inches equal 1 metre. On page 90 of the book under notice is the following:

"The filling is ordinarily reckoned arbitrarily by the quarter inch, and it is necessary, before the calculation of a fabric, to convert the picks per quarter inch into picks per centimetre. There are 148 quarters of an inch in a metre; 1 centimetre is equal to 1.48 quarters of an inch; 5 picks per quarter inch are equal to 7 4-10 picks per centimetre."

In *L'Industrie Textile*, the leading French textile journal, for August 15, 1902, is a four-page description of a new worsted-spinning frame, and an account of a test of it. At the conclusion of the mechanical description the capacity of the machine is given for different sizes of yarn. These sizes are given in the Roubaix system, under which the test was made, which figures are then translated into the metric system. It is wholly impossible in a few paragraphs to even indicate the confusion and complexity which are shown by these books to prevail in the weights and measures of metric Europe. The complications introduced by them into textile calculations are beyond belief.

Old Units in German Mechanical Industries.

In the *American Machinist* for May 3, 1900, is an article by Mr. Henry Hess, of Berlin, Germany, on metric screw threads. Mr. Hess is a personal friend and an accomplished engineer, a fact which is attested by his position. He was formerly with the Niles Tool Works of Hamilton, Ohio, and when that corporation established its great branch works in Berlin, under the name of the German Niles Works, he was selected to go to Germany, in order to carry American practice and American methods there and form a connecting link between the two companies. Please remember that he is actively engaged in machine construction; not in a business capacity, but as a designer and constructor, and he knows the facts from the inside.

Mr. Hess writes (italics mine): "To work with both millimetres and inches in the same shop, and not infrequently on different portions of a single piece, is too illogical an arrangement to maintain itself. A further complication is brought about by the fact that, though like in name, an inch is a widely varying quantity in different sections. In Germany alone there are at least half a dozen, of which two, the Rhenish and the English, are in such *very general use* as to cause great confusion."

I have a personal letter from Mr. Hess dated at the German Niles Works, Sept. 15, 1902, from which I quote the following (italics mine): "It is quite true that the great majority of these (old provincial inches) are no longer in use; still it is today necessary to be very careful in using rules *that are purchasable in every hardware store*, to make sure whether the inches that are given on the reversed sides and Rhenish or English inches. Nearly universally *the carpenters and other building mechanics use the Rhenish inch*, and we have occasionally found that men in our shops have made use of their private Rhenish foot-rules. As to this matter in France I cannot tell you very definitely, but I believe that similar conditions exist there, though not to as great an extent."

At my request Mr. Hess has sent me a collection of these German-made scales, which, in addition to the sacred millimetre, give upon their various edges the English, the Rhenish, and the French inch, the latter measuring 37 to the metre, as already explained. In an accompanying letter, after saying that the purchase was made "in one of the larger retail hardware shops in Berlin, located in the manufacturing district," he goes on to say:

"In talking with the proprietor, I learned that practically all of the small tradesmen with whom he has to deal still stick to the use of the inch, and when they want to sell them anything according to metres, they are informed that they are used to the inch and foot and do not wish to be bothered with the metre."

To understand the full force of this it must be remembered that to sell goods by other than metric measures in Germany is a finable offense, and Mr. Hess' informant has, in fact, paid such fines for acceding to his customers' demands. We have also the testimony of Mr. J. H. Linnard, a naval architect of the Navy Department, whose testimony before the House committee is referred to at length farther on. I have a letter from Mr. Linnard dated at Washington, Sept. 5, 1902, in which, after saying, "I recently made a short trip to Germany," he goes on to say:

"The visit I made to Germany was in connection with visits to shipbuilding yards, and I did not come in contact with other merchants or manufacturers. I made inquiry, however, in the shipbuilding yards whether the use of the metric system was universal in Germany. I found that in all government work it was universal, but that two yards, one of considerable importance at Flensburg, and one at Hamburg, still use the English system of measurement for their ship work."

At the hearings of the House committee Prof. Elihu Thompson, in the course of his pro-metric testimony, read in abstract a letter from Mr. A. H. Moore (page 4), saying:

"Speaks from practical experience of the use of the metric standard in Germany, he says that the Whitworth thread is in almost universal use in Germany and central Europe. * * * Others (other machines) were designed in Berlin and figured in millimetres, but in these the drill and tap holes were figured in inches. The peculiar reason for this was that, no good twist drills having millimetre dimensions were to be had, while American twist drills were very cheap."

The general use of English pitch threads in Germany is, of course, well known, but it will do no harm to take the fact from a metric advocate's mouth. The discriminating engineer will recall that English sized twist drills make English sized holes, and he will take the use of English sized screws and twist drills as additional evidence that the millimetre has not yet driven the inch from German machine shops, and that Germany is still in the transition period.

Old Units in Spanish America.

The most recent star example of quick change in weights and measures to which the metric advocates point is Mexico. Mr. Troemner testified (p. 11): "Only recently, within the past two weeks, I talked with the Commissioner of Mines of Mexico, who visited me, and he told me the metric system was working magnificently in Mexico and that they had made the jump at once from one standard to the other."

Following is an extract from a letter from the Superintendent of Machinery of the Mexican Central Railway—Mr. Ben Johnson. The letter is dated at Mexico City, Oct. 7, 1902:

"We use nothing whatever but American measurements in the work of the mechanical department. Our drawings of locomotives and cars and our shop tools are all in American measurements, and as far as my information goes, this is the case with nearly all railroads in Mexico."

The Mexican Commissioner of Mines has, it is clear, no knowledge of the practice of Mexican railroads. What reason is there for supposing that he has any knowledge of other interests outside his immediate personal experience? The metric system of weights and measures became compulsory in Mexico, Jan. 1, 1884.

Following are extracts from a letter by Mr. D. S. Iglehart, of the export house of W. R. Grace & Co. He lived for a time in Peru, and has fortified his recollection of the

facts by consulting the Peruvian Consul General:

"I have today seen the Peruvian Consul General, who advises me that the metric system of weights and measures was established as the legal standard in Peru, Nov. 29, 1862. As regards the system used in length measurements among merchants, the standard almost universally employed is the vara (.836 metres). This is especially true of the retail trade. Among wholesale merchants the metre is at times employed, as is also our yard. Feet and inches are used in connection with the vara. What I have said regarding Peru is more or less true of Chile, although I think that there the metric system is a little more extensively employed."

The fatal mistake of the metric advocates and the weakness of their case lies in their assumption that the statute book is an index of the practice of the people. The arguments for the saving of time in calculation, for the simplification of our weights and measures and for the saving of time by school children are all based on the tacit assumption that the old units are to disappear. As they have not done so elsewhere they will not do so here, and every one of these arguments falls to the ground.

Reasons for the Length of the Transition Period.

An essential feature of the scientific method is the explanation of the facts as found, and it is easy to show why the period of transition must be so long. The pamphlet containing this testimony before the House committee contains a letter from the Brown & Sharpe Mfg. Co., which contains a sentence embodying more wisdom and knowledge of the subject than all the pro-metric testimony. I quote (page 190): "The question of weights deals rather with the future, but * * * linear measures are tied irrevocably to the past." The man who wrote that sentence was inspired, and for a time it will become my text.

If this system were made compulsory tomorrow, and the people were to receive it with enthusiasm, the gas pipes in the ceilings of our homes alone would keep the old system alive for fifty years. Remember the proof that has been given that the metric system necessitates metric sizes. Now make the gas tips which we replace so often with metric threads, and there isn't a chandelier in this country that will take them. Make the chandeliers with metric threads, and there isn't a gas pipe end projecting from a single ceiling in this country which will take them. A fair question to ask here is, how long does it take on the average for a gas pipe to wear out? Our friends tell us that for a time we will use transition fittings with English threads at one end and metric threads at the other, but this begs the whole question. The transition fittings must be made. The length of the pipe does not alter the thread or the tools for making it. The tools and the equipment must be preserved. But why make a transition fitting at extra cost and serving no purpose except to furnish an added joint to leak? We may be sure that so long as pipes with English threads endure in our ceilings, chandeliers will be made with English threads to fit them. Why is this? Because "measures of length are tied irrevocauly to the past."

Every factory contains overhead lines of shafting which with the pulleys to fit are a standardized line of manufacture. With standard fits pulleys may be changed from place to place by simply removing and replacing. Put up a metric line shaft, and not a pulley in this country will fit it, nor will any metric pulley fit an English line shaft. A line of shafting was scarcely ever known to wear out I know one which is forty years old, and it was, I believe, second-hand when I made its acquaintance. So long as existing shafts endure we may be sure English dimension pulleys will be made to fit them. Why? Again, because "measures of length are tied irrevocably to the past."

They tell us that we may continue to use the old units in repairs. Consider the couplings which connect the air-brake hose on all railroad cars. A new coupling on one car connects with the old one on another car. The time will never come when that can be changed, unless they are all changed at once. Why? Because "measures of length are tied irrevocably to the past."

At the hearings of the House committee a curious fact was developed (Mr. Buck, page 145). The older part of Philadelphia was laid out by a defective surveyor's chain which, instead of being 100 feet long, was in reality 100 feet 3 inches, and in that part of the city today 100 feet 3 inches is legally 100 feet. By a curious process of reasoning this was made to appear as an argument for the metric system, though how the adoption of that system is to change the layout of the streets I do not quite see. Why does this anomaly, this nuisance, persist, and why is it impossible to get rid of it? Because "measures of length are tied irrevocably to the past."

"The early French settlers of St. Louis and vicinity laid out their land in arpents. * * * Since that time the territory has passed from French into Spanish hands, and from Spanish into our own. But today there is scarcely a piece of real estate in St. Louis that is not measured in arpents." Why? Because "measures of length are tied irrevocably to the past."

[Concluded in issue of January 22.]

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

Mayer's Machine Works, Brooklyn, have been incorporated; capital, $20,000. Directors, E. V. Mayers, Summit, N. J.; P. F. Wallace and Fred White, New York City.

The Riverside Foundry & Machine Works, Riverside, Cal., have been incorporated with a capital of $50,000. The principal stockholder is H. A. Landwehr.

The Imperial Pneumatic Tool Co., with a capital stock of $25,000, has just been established in Montreal. The capital is all American.

The Haggas Gas Engine Co., Limited, Toronto, Ont., capital $40,000, has been incorporated by H. W. Petrie, W. S. Haggis, T. A. Kilgour, M. M. Petrie and B. D. Petrie. Ontario charter.

The Western Boiler & Iron Works, Denver, Col., have been incorporated with a capital of $50,000.

The East Chicago Bridge & Iron Works, Chicago; capital, $50,000, have been incorporated for manufacturing structural iron and steel; incorporators, Charles O. Baughman, John W. Greekmur and N. E. George.

The Hamilton Machine Tool Co., capital $500,000, has been incorporated at Hamilton, O., by Charles F. Hilker, Osian W. Kuhn, Arthur T. Leatherby, Nelson E. Spear and Eugene S. Rich.

The Phoenix Foundry Co., Chicago, has been incorporated with a capital of $10,000; incorporators, August W. Miller, Arthur D. Rehm and Stephen R. Wilson.

The Wagen Skein & Nut Lock Co., Pana, Ill., has been incorporated with a capital of $50,000 to manufacture hardware.

The Standard Railway Equipment Co., with capital of $2,000, has been incorporated at St. Louis by W. P. Murphy, W. R. Colcord, E. R. Hensel, James A. Carr and H. C. Bluedorn, to manufacture and deal in pneumatic engines, hammers, drills and other tools.

The plant of the Snead Architectural Iron Works, Louisville, Ky., having been almost entirely destroyed by fire on the morning of Dec. 20, that company is anxious to receive catalogues of all tools and machinery used in its business.

The Jefferson City Sand & Gravel Co., Jefferson City, Mo., will need swinging derrick, clam-shell dipper (for unloading sand from barges), hoisting machinery, etc., later on, but is not yet ready to place orders.

Smith & Dreyer, 51 North Mechanic St., Cumberland, Md., is in market for 30-inch automatic cut-off emery grinder.

The Iron Pipe & Supply Co., Trenton, N. J., recently incorporated, with a capital of $100,000, will build a foun-

dry in the spring and will need equipment for a plant of 250 to 300 horsepower. The company will manufacture cast iron soil pipe and specialties in cast iron for contractors. Address Wm. S. D'Arcy, 512 Perry St., Trenton, N. J.

W. W. Marshall, Elkton, Va., will want iron turning lathe and several other machine repair shop tools.

The Union Iron Works, Mobile, Ala., have been incorporated with a capital of $30,000.

The Oklahoma Iron Works Co., Guthrie, Ok., has been incorporated with a capital of $25,000. The incorporators are F. C. Damm, L. H. Lohr and Geo. Dodson.

The Jarvis & Bro. Co., successor to Jarvis & Bro., Huntington, W. Va., expects to enlarge its foundry. Definite plans have not yet been formed.

The Union Iron Works, Mobile, Ala., have been incorporated with a capital of $30,000.

Thomas F. Flinn, engineer of the Quaker Cement Co., 26 Broadway New York, is in the market for second-hand tandem or cross-compound engines, aggregating 4,000 horsepower, and in units of 400 to 750 horsepower each. Give full particulars and price.

The Chrome Steel Works have been incorporated under the laws of New Jersey with a capital stock of $500,000. The company will manufacture iron and steel in various forms in Chrome, N. J. The incorporators are Alphonse Kloh, Chrome, N. J.; George W. Morgan, and Charles A. Canda, Carteret, N. J.

Collingwood, Ont., has voted a bonus of $25,000 to a wire and nail factory. The output will be 25 tons per day each of nails and wire fencing.

W. C. Pomeroy & Co., Northampton, Mass., have purchased the foundry operated for many years by Wm. R. Clapp, and will put in new equipment.

At the office of the supervising architect, Washington, D. C., sealed proposals will be received until Feb. 3, 1903, for the construction of fire escapes in the United States appraisers' warehouse in New York City.

Fires and Accidents:—

Fire destroyed the main building and a part of the shipping building of the Federal Mfg. Co., South Chicago, Jan. 9, causing a loss of $150,000. Cold weather was the indirect cause of the fire. In heating thickened oil it blazed up.

New Construction:

It is announced at Montreal that a purely Canadian company, under the presidency of M. J. Haney, of Toronto, will shortly commence the construction of locomotive works at Longue Pointe, near Montreal. The site has already been purchased and construction will be commenced without delay. The works are expected to employ 600 men, and to turn out about 100 locomotives a year.

The laying of the cornerstone of the plant of the American Drop Forge & Tool Co., at Wayland, N. Y., a few days ago, was celebrated with enthusiasm by the citizens. A bottle of wine was broken over the stone and the plant was christened "Success." Speechmaking and general rejoicing followed.

Emil Molke has purchased a site at Bloomington, Ill., and will build a machine shop.

The Hayward Foundry & Machine Co., Monongahela, Pa., has finished the construction and equipment of its works and commenced making castings this week.

The Bristol Motor Car Co., Bristol, Conn., recently incorporated, has increased its capital stock from $10,000 to $40,000. A factory will immediately be erected.

The Burns Boiler Works, De Pere, Wis., will build an addition, 100 x 200 feet. A new office building will also be erected.

H. B. Underwood & Co., Philadelphia, will build a machine shop, 23x51 feet.

Richard Turner and Zine Beecher, Marysville, O., will build a foundry and will manufacture gas engines.

The Norwalk Steel & Iron Co., Norwalk, O., will erect a steel casting plant, the main building to be about 300x100 feet.

The St. Paul Foundry Co., St. Paul, Minn., is preparing plans for the erection of new buildings for a malleable iron foundry. The details of the new expansion are not yet completed, but the proposed plant will cost about $200,000. About 300 workmen will be added to the force when the new plant is completed. This company is now making extensive additions to its foundry department. The work under way involves an expenditure of $50,000 for buildings and as much more for equipment. The steel shop, where the riveting work on structural steel is now carried on, will be enlarged to give floor space of 13,000 square feet. The foundry will be enlarged so that its length will be 425 feet and its floor space 15,000 square feet. A new pattern house has been erected. Belt power throughout the plant is being superseded by electric power. A number of electric cranes will be put in.

The Toronto Steel Co. is about to establish a rolling mill in connection with its other works, and will secure all its pig iron and steel billets from the Dominion Iron & Steel Co. The company has had the erection of a rolling mill under advisement for some time, but the conclusion to proceed with the work was arrived at only a few days ago.

The Chase Rolling Mill Co., Waterbury, Conn., will build an addition 90x100 feet, with roof of concrete.

The Topeka Bridge & Iron Works will build a plant at Topeka, Kans., which it is expected will be in operation by April 1. The company will supply all kinds of structural material for highway bridges.

The erection of the iron foundry and boiler works of the I. P. Symons Co., at Centralia, Wash., has been completed. The main building is 252x45 feet.

The International Steam Pump Co., Boston, will build a machine shop, 534x110 feet, at a cost of $100,000.

E. M. Burr has made extensive additions to his foundry in Champaign, Ill. He has built one brick addition and expects to build another in the spring.

Williams, White & Co., Moline, Ill., are about to make some important improvements in their foundry, including the installing of a large new cupola and also of a subsidiary crane.

The Sebring Forging Co., Sebring, O., recently incorporated, is building a new forge plant, with new equipment. The main building will be 60x160 feet, machine shop 20x40 feet, and boiler room 30x35 feet. Equipment will consist of forging machines and headers, ranging from 1½-inch up to 4-inch drop hammers, Bradley hammers, bulldozers, eye benders, punches and shears, multiple pin drills, lathes, shapers, radial drill and planer, one 125-horsepower boiler and 100-horsepower engine. The company will manufacture all classes of forgings within the range of its equipment, and expects to be in operation on or before April 1.

The Pittsburg District:—

The Fawcus Machine Co., 28th and Smallman Sts., Pittsburg, manufacturer of gears and special machinery, reports a successful year just ended. The business was started about two years ago with about a dozen men and has so increased that now upwards of 60 are employed. The plant has been running double turn steadily for about a year and a half, and continues to do so. The cutting of spur gears, bevels, worm gearing, etc., is the specialty of this company. It has shipped its product to all parts of the United States, as well as Canada, Mexico, and Europe. The United States government has been a customer and has sent second orders based, as always, on rigid inspection. The Fawcus Machine Co. has also turned out many high-grade machines, including the following: Under-cutting mining machines for one of the large coal companies; patented tin plate machines for the Bray system for the American Tin Plate Co.; hot sawing machinery for the Colorado Fuel & Iron Co.; a special boring machine for automatically boring large taper holes, heavy double cut off and centering machines, etc. In the past

year the company has constantly increased its equipment and the outlook for the present year is such as necessitates a continuance of this policy. Plans are under way for increasing the present floor space, the installation of additional machinery for gear cutting and special work, and another engine of about 60 horsepower.

On Thursday, Jan. 8, the stock of the Sharon Steel Co. was deposited with the Union Trust Co., for transfer to the Union Steel Co., and subsequently for exchange for bonds guaranteed by the United States Steel Corporation. Practically all of the outstanding stock was deposited, as according to the terms of the sale to the corporation the stock is taken up at $216 for each $100 share.

The Bindley Merchandising Co., of Pittsburg, has been granted a charter with a nominal capitalization of $1,000. The incorporators are John Bindley, W. H. Cochrane and E. J. Lloyd. The new company is identified with the Bindley Hardware Co., and the charter was taken out for extending the operations of the latter concern. The Bindley Hardware Co. some time ago awarded a contract for the erection of a large warehouse, the American Bridge Co. to do the structural work, the contract calling for fully 3,000 tons. When this warehouse is completed it is the intention of the company to carry a full line of sheets, tin plate and bar iron and steel.

The planishing department of the W. DeWees Wood plant of the American Sheet Steel Co., at McKeesport, Pa., was destroyed by fire on Sunday, Jan. 11. Fire also did some damage in the rolling mill department so that a number of the mills will be idle for a week while repairs are being made. The building that was destroyed was built in 1832 and owing to its age was to have been torn down shortly, plans already having been prepared and contracts awarded for a new steel clad structure.

The first cast was made last week at the new car wheel plant of the Central Car Wheel Co., at McKees Rocks, which adjoins the plant of the Pennsylvania Malleable Co. It proved entirely satisfactory and the plant was placed in regular operation this week. New methods adopted for handling metal and other economies have reduced the cost of producing wheels materially. When operating in full the output will be about 500 wheels daily.

The Somerfield Machine & Mfg. Co., of Pittsburg, is being organized with $100,000 capital to take over the machinery business of R. G. Sommerfeld at 224 Third Ave. A site will be secured near Pittsburg, the present plant will be removed to it, and an extensive structure will be erected. R. G. Sommerfeld will be president and general manager and John Bucock secretary and treasurer.

The new furnace at the Edgar Thomson plant of the Carnegie Steel Co., at Braddock, Pa., will be blown in in about a week.

The Pittsburg Meter Co., one of the Westinghouse industries located at East Pittsburg, Pa., has plans for the erection of an addition 50x60 feet and four stories. Meters of all kinds are manufactured at this plant and the output of the past year, 175,000 meters, will be increased to 300,000 when the new addition is in full operation. A large amount of machinery will be installed.

M. Reamer & Son, operating a plant at Manor Station, Pa., for the manufacture of shovel, pick and ax handles, will be taken over by the newly incorporated Reamer Handle Co., with capital of $75,000. A site has already been secured at Manor for a new plant with several times the output of the present plant. A large amount of wood working machinery will be purchased as well as power equipment.

W. J. Carlin, of the W. J. Carlin Co., denied that his plant would be removed to Claysville, Pa. A report from Claysville was to the effect that the Carlin Co. had secured a site at that place and that the plant would be removed from Pittsburg at an early date.

General Industrial Notes:—

Nathan Loser, of Cleveland, has been elected trustee of the Ohio Rolling Mill Co., of Findlay, O., by the creditors. The creditors held a meeting in Toledo last Saturday and more than two-thirds agreed to accept the compromise of 33⅓ percent. If this compromise is confirmed by the court, the mill will resume operations.

As soon as sufficient coke has been accumulated one of the furnaces of the Lackawanna Steel Co. at Buffalo will be started. In April three furnaces are expected to be in operation.

Among recent orders for cranes reported secured by the Northern Engineering Works, Detroit, Mich., are the following: Three 70-foot span electric traveling cranes, for Oil Well Supply Co.; one 55-foot span, for Saginaw Plate Glass Co.; three 40 to 50-foot span electric traveling cranes, for Great Lakes Engineering Works; one 10-ton 40-foot span for Detroit Foundry Co.—these in addition to a number of smaller electric and hand power traveling and jib cranes. They also report the recent sale of three electric cranes for export to England, and one for India.

The new foundries of the Michigan Malleable Iron Co., Detroit, are now in operation.

The Keystone Mfg. Co., Rock Falls, Ill., which failed in 1897 and was re-organized, has again gone into the hands of a receiver, H. L. Wilson, of Chicago. The company manufacturers farm implements and has shops and foundries at Rock Falls and also at Council Bluffs, Ia. Liabilities, about $350,000.

The Queen City Range Co. has moved from East St. Louis, Ill., to Belleville, Ill., where the company has erected a new plant 60x200 feet. The capital stock is now increased to $20,000. In addition to the line of last season the company is making a new line of steel ranges and steel cook stoves, which will be on the market by Feb. 1.

The Marinette Iron Works Co., Marinette, Wis., is rapidly extending the sales of its gas engines to foreign lands and is now contemplating the establishment of an agency in Portugal.

The American Steel & Wire Co. has secured a contract for twenty-seven miles of wire for shipment to Tokio for utilization in the construction of an electric traction system.

The Eastwood Wire Mfg. Co., of Bellville, N. J., has recently taken some fair sized orders for wire, etc., from Hornig & Mock, 7 Mark Lane, London, E. C.

Work has been suspended on the construction of the new tin plate mills of the Follansbee Bros., of Pittsburg, at Mahan's, West Virginia, across the river from Steubenville, O. Conflicting reasons are given for this action, one, attributed to an officer of the company, being that it was realized that it would be impossible to operate the plant at present prices except at a loss. The engineer in charge of the construction, Henry Strauss, has been quoted as saying that a large force of men was laid off because it was discovered that the work could be done as well and much more quickly in the spring. He was positive in saying that work will be resumed in the spring.

The Machine Foundry Co., Ltd., of Kalamazoo, Mich., which started in business about two months ago, is prepared to make all classes of light and heavy gray iron castings. It is equipped to cast up to six tons. The officers are: Geo. Polasky, chairman; G. J. Bremer, vice chairman; F. G. Bremer, secretary and treasurer.

The annual meeting of the Engineers' Society of Western Pennsylvania was held at Pittsburg on Thursday evening, Jan. 8. Charles F. Scott, the retiring president, delivered an address reviewing the notable achievements of the last year in industry. Mr. Scott is chief electrical engineer of the Westinghouse Electric & Mfg. Co., president of the American Institute of Electrical Engineers and vice president of the Academy of Science and Arts. Chester B. Albree, at the head of the C. B. Albree Co., of Allegheny, Pa., was elected Mr. Scott's successor. Mr. Albree has done much for the society in the past and his election to the presidency is in recognition of his efforts. James M. Camp was elected vice president to serve one year, and Samuel Diescher to serve two years. A. E. Frost was re-elected treasurer and C. W. Ridinger secretary.